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STEEL

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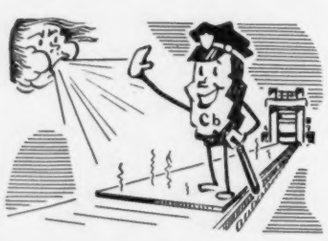

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As the Editor Views the News

■ STEEL production last week rose another 3½ points (p. 18) to 87½ per cent of ingot capacity, and will rise further over the next few weeks. New business, however, has moderated (p. 73) since consumers generally are covered to the end of this year, while a good many are covered through early 1940. In general, consumption is rising. While current inquiry appears to promise increasing pig iron and steel orders from abroad, particularly neutral countries, only sharp increase in such business so far has involved tin plate. The number of active blast furnaces (p. 19) was moved up by 31 in September to 169; more have been blown in since Oct. 1. A number of Pittsburgh district companies (p. 20) will install additional cold-rolling equipment without delay.

• • •

Toolmakers Oppose War

By formal resolution, members of the National Machine Tool Builders' association last week (p. 21) declared their opposition to war. "It may be very tempting to take fullest possible advantage of a sudden war-created foreign demand," declared Wendell E. Whipp, retiring president, "but if that demand is fulfilled at the expense of American industry the price that inevitably must be paid will be a heavy one." The meeting revealed a tendency among machine tool builders to ration their shipments abroad, setting aside a definite percentage of each month's output for all foreign markets. Representative machine tool dealers and users (p. 22) point out that some tools now cannot be had for shipment in less than six months to a year; they believe home requirements should come first.

• • •

Ruling on Steel Wage

District of Columbia court of appeals has ruled (p. 25) the secretary of labor exceeded her authority in determining minimum steel wages under the Walsh-Healey act. . . Representatives of the steel industry conferred last week with justice department officials who (p. 28) will present the steel case before temporary national economic committee. . . . State department (p. 28) is preparing a reciprocal trade agreement with Chile; briefs will be received until Nov. 11. . . . Last week's distribution conference at Boston warned against price inflation by dealers. . . War department (p. 26) has placed some 10,000 orders for 70,000 war items, most of them sealed and not to be opened until the manufacturers are so instructed. . . . English iron and steel industry (p. 15) now is fully mobilized for war.

• • •

Guy Hubbard, STEEL's machine tool editor, discusses the high production efficiency obtainable through use (p. 40) of versatile machine tools of the station type. . .

Steel for Farms

Climaxing months of research work, Tennessee Coal, Iron & Railroad Co. has undertaken volume production (p. 42) of prefabricated, knocked-down, steel residences and farm buildings for southern locations; they provide a large outlet for steel . . . Flame descaling process, relatively new, is gaining in removal of scale (p. 46) from blooms, billets, slabs, forgings and castings . . . Stamping, forming and working of magnesium alloys need not be difficult (p. 48) if latest approved practice is followed . . . Many new metal specifications of importance have been approved (p. 50) by the American Society for Testing Materials.

• • •

Aircraft Heating

Because 5 or 10-degree weather may be encountered in the air when ground temperature is 95 to 100 degrees Fahr., airplane cockpit and cabin heating systems must always be efficient. Changes in material and design have permitted production of such systems which have service life of 450 hours as compared with 75 previously . . . Difficulties with the simple "firecracker" method of automatic welding disappear (p. 54) when certain precautions are observed . . . New protective and decorative coatings are available (p. 54) for magnesium metals . . . Radical change in refractory practice in open-hearth plants is use of basic-magnesite brick (p. 56) over the taphole to prolong life . . . By a new method, polished steel is cleaned in one operation (p. 62), assuring brighter, more lustrous deposits with better coverage.

E C Kreutzberg

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British Steel Industry Moves Quickly, Smoothly to War Basis

By VINCENT DELPORT
European Manager, STEEL

LONDON

■ ONE major effect of modern warfare is the dislocation of economic conditions. Because the complicated network of international trade spreads the world over the disorganization is not limited to the countries actually at war, but to neutral countries as well.

Because of the instantaneous transmission of news and of the rapidity of transport the consequences of a war between major nations are felt immediately. Production, transportation and distribution are affected individually and collectively. The longer the war, the more widespread and the more lasting are its effects.

In these times, one of the most necessary requisites for business to carry on is adaptability.

Apart from the actual destruction of means of production which occurs in the war zones proper, the important factor in the reshaping of business structure is the control that is immediately imposed upon industry and trade by governments. In belligerent countries production is diverted into definite channels towards the prosecution of war, and interdictions, restrictions and regulations are set up against the importation and exportation of all raw materials and manufactured goods. Actual means of transportation are controlled—or hindered, if not destroyed—by war at sea.

In war, the iron and steel industry becomes of paramount importance. It is therefore one of the first to be taken under government control.

Where means of production are

♦

■ The accompanying article by Mr. Delport outlines war measures affecting the iron and steel industry in Great Britain. A second, dealing with conditions in the Continent will appear in an early issue

♦

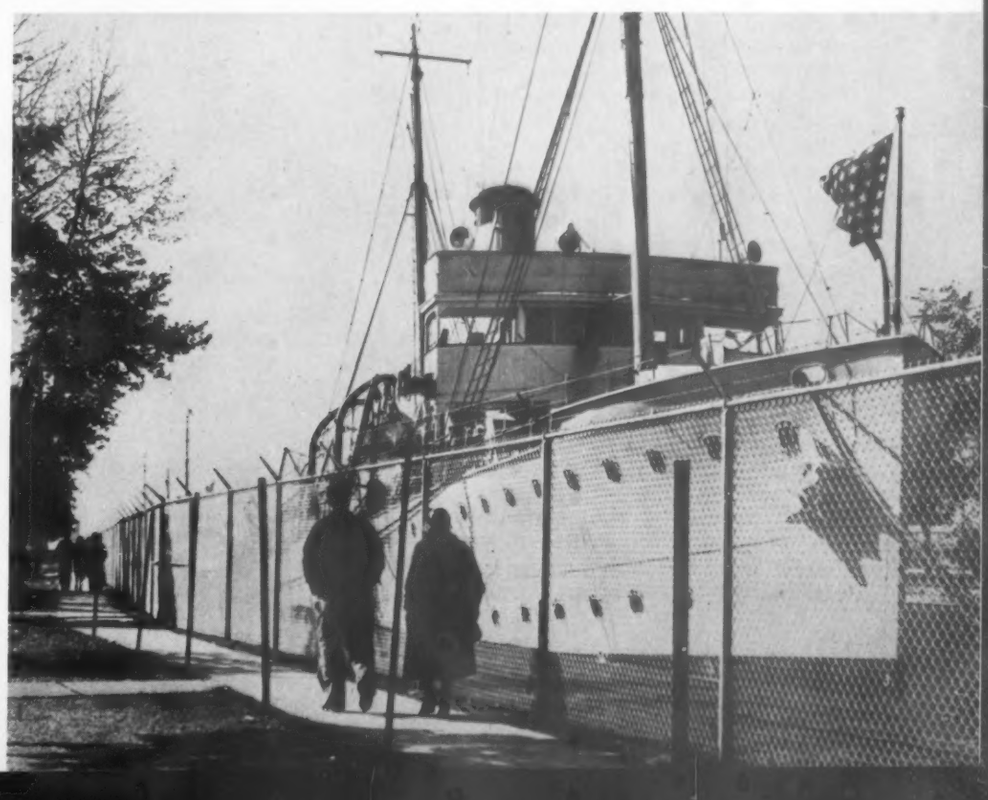
relatively sheltered and supplies of raw materials reasonably insured, steel output will be intensified until it reaches capacity. Great Britain enjoys a favorable position in this respect. At present supplies of coke and ore are ample, and there are many sources from which future supplies can be supplemented, the greater part of which is certain to reach the shores of Great Britain safely.

The British iron and steel industry is also fortunate in regard to the smooth manner in which it passed under government control, thanks to the organization and official contacts that had already been in existence during the more recent years. Readers of STEEL are familiar with the facts as they were immediately before the war.

The steel industry was divided into a number of associations, each representing a particular class or group of products, and these associations were affiliated with the British Iron and Steel federation, which represented the industry as a whole in its relations with the government, and which had for its chairman Sir Andrew Duncan.

Each member-association controlled its own products as regards quotas and prices, but prices could not be raised beyond certain limits without the authority of the import duties advisory committee, an official body depending from the board of trade. To complete the picture it should be added that imports of iron and steel into Britain were subject to quotas and to import duties through the import duties advisory committee, and that exports were regulated by arrangements with the International Steel Entente through the

Guarding Gateway to Lake Superior Ore



■ Industrially strategic and correspondingly vital to our national defense are the locks at Sault Ste. Marie., Mich. Guarding against possible sabotage, United States army has erected barbed wire fence along the locks, admitting none without special permit. Ore movement from upper lake ports this season to Oct. 1 totals 30,360,774 gross tons, 114.4 per cent above the like period last year. Acme photo

British Iron and Steel federation and its subsidiary the British Steel Export association.

On Sept. 1, the day Germany attacked Poland, the British government issued an order under the emergency powers (defense) regulations, placing the iron and steel industry under the control of the ministry of supply. This order forbids any person to acquire any of the articles scheduled without a license granted by the minister, and also forbids any person to sell any of these articles except to a person who produces the license. The order also gives a second schedule, of prices which must not be exceeded either in buying or selling the articles listed in the first schedule.

Interesting points are that the articles listed in the first schedule cover pig iron and most steel products which are already controlled by the existing member-associations of the Iron and Steel federation, and that the maximum prices listed in the second schedule are the prices that were previously agreed upon, and which the federation had announced would remain in force until Oct. 31.

Furthermore, Sir Andrew Duncan, the chairman of the British Iron and Steel federation, has been appointed comptroller of the industry, directly responsible to the minister of supply. Thus, from the producing end the existing organization of the iron and steel industry dovetailed with the minimum of disturbance into the government machinery.

Raw Materials Supply Assured

Supply of raw materials to produce also is assured. As regards coal and coke there is no shortage, and many iron and steelworks operate their own coke ovens. As regards scrap, the works can buy home scrap at the prices established for the various grades.

Imported scrap is allocated to the consuming works in proportion to their requirements; scrap is regulated by an association which is affiliated with the Iron and Steel federation.

Regulation enforcing the necessity of applying for a license on the part of consumers is subject to certain exceptions. There are no restrictions in regard to: Government defense departments; other government departments; local authorities for civil defense purposes; persons requiring supplies under the civil defense act 1939, or otherwise for air raid precautions; railway companies for repair and maintenance work; ship builders, ship repairers and marine engineers; collieries; persons having passed contracts previous to the date of the order, and subject to priority being given by the suppliers to deliveries to the official departments and the above mentioned industries of national importance; persons purchasing from stockholding merchants out of their stock for urgent requirements during 14 days from the date of the order persons purchasing quantities of 1000 pounds or less.

For all new business, applications to sell must be made to the Iron and Steel federation, through the local sections, each of which is supervised by a director who acts on the instructions of the comptroller.

Exports Restricted

Licenses to purchase are granted by the minister of supply subject to the requirements of the government and other essential services being covered. This amounts to a tightening up of the conditions prevailing a few months before the war, when the government exercised its privilege of priority for orders pertaining to national defense. Merchant stockholders naturally also require a license under the new order.

Export trade has lost none of its vital interest to the British steel industry, but there are many restrictions which, under present conditions, are unavoidable. Loss of trade with the enemy is practically negligible, but home requirements must be met before any surplus can be made available for export; there are also difficulties in regard to transport and financing.

However, wherever possible export trade will take place and every effort will be made to preserve Britain's markets. Exports of controlled products are effected through the British Steel Export association, which is closely linked with the Iron and Steel federation. In addition to the license required for purchasing steel products for selling abroad, exporters also require a license from the board of trade for sending the product out of the country. Licenses for materials or products essential to the country will obviously not be granted, and exports of iron ore, scrap, and certain classes of machinery are prohibited.

It will be readily seen from the above picture of the present organization of the British steel industry that ordinary commercial trade, both domestic and export, is for the time being severely restricted and, at the time of writing, new business is practically at a standstill.

However, within the limits imposed by government priority orders and transportation difficulties, consumers are not hampered as regards contracts and orders placed before Sept. 1, although deliveries are retarded, and it is generally accepted that immediate requirements are well covered. It is also a satisfactory feature for consumers that prices will remain stable until the end of October—although an increase is expected to follow.

From the point of view of production, the country is better equipped than it has ever been, thanks largely to the process of reorganization that has been developing in the past five years. Daily output of raw steel in August was higher than in August in the peak year of 1937.

Pig iron is plentiful; semifinished steel is rather scarce but is being supplemented from an increasing number of sources of importation including France, Belgium, Australia, Canada and the United States.

Capacity of output of steelworks is increasing and rolling mills of the latest type, especially for the mass production of sheets, have been installed in various works and are now in operation.

Without doubt the industry is keyed up to meet the present emergency and is entering a period of unequalled activity.

Available Assets of Britain and France Now Larger Than in 1914

■ ANGLO-FRENCH resources readily convertible into foreign exchange were somewhat higher at the outbreak of the current war than in 1914, according to an analysis by the National City Bank of New York.

Gold stocks at home and abroad are twice as large as in 1914 and are now concentrated in central banks whereas in 1914 more than 60 per cent of their gold was in circulation.

Estimates of British and French gold holdings and dollar assets:

(In Millions of Dollars)

Great Britain	1914	1939
Gold at home and abroad	$795	$2,200
Bank balances in U. S.	270	580
American negotiable securities	3,650	1,090
Direct investments in U. S.	600	700
Total	$5,315	$4,570
France		
Gold at home and abroad	$1,750	$3,025
Bank balances in U. S.	30	275
American negotiable securities	365	285
Direct investments in U. S.	45	25
Total	$2,190	$3,610
Combined Total	$7,505	$8,180

"While the Anglo-French holdings

of negotiable dollar securities are much less than at the outbreak of the last war, the technique for their mobilization for the financing of trade and the support of exchange is much better developed," say the bank's analysts.

"Steps to marshal bank balances and negotiable dollar securities were taken several months ago. In the last war, such steps were not taken until 1915, when the British government invited the sale to itself of American securities owned by British investors, and two years later made such sale compulsory.

"In addition to the gold and dollar assets of Great Britain and France, consideration may well be given to their extensive investments in the dominions and colonies. These include numerous Canadian securities, Rhodesian copper shares, Rand mining shares and large British investments in neutral countries such as South America, many of which doubtless could be sold in the New York market for dollars. British investments in Canada have been estimated at about $2,500,000,000, in South Africa at $1,250,000,000 and in Argentina at $2,200,000,000.

"Just how large a portion of these securities the British government would be willing to transfer to other countries is, of course, uncertain, and there is also the question as to how much the foreign security markets could readily absorb. In the case of gold, however, there would probably be a greater willingness by the British government and public to part with the metal now than in 1914, when emphasis upon gold as a backing of currency was much stronger than it is today.

"Finally, it should be pointed out that an important continuous source of dollar exchange available to the allied powers lies in their new production of gold. Approximately $730,000,000, or nearly two-thirds of the world output of gold (outside of Russia), was produced within the British and French empires in 1938, whereas in 1914 their annual production was but $260,000,000."

BELLIGERENTS FURNISHED HALF WORLD STEEL EXPORTS

England, France, Germany and Poland have been among the world's chief steel-exporting countries since January, 1936. Total steel exports from those countries amounted to an annual average of 6,990,000 gross tons during the period, somewhat more than half of the world's aggregate.

Recent disruption of normal commerce, however, is forcing steel-importing countries to shift sources of supply from the belligerents to other steel-exporting countries.

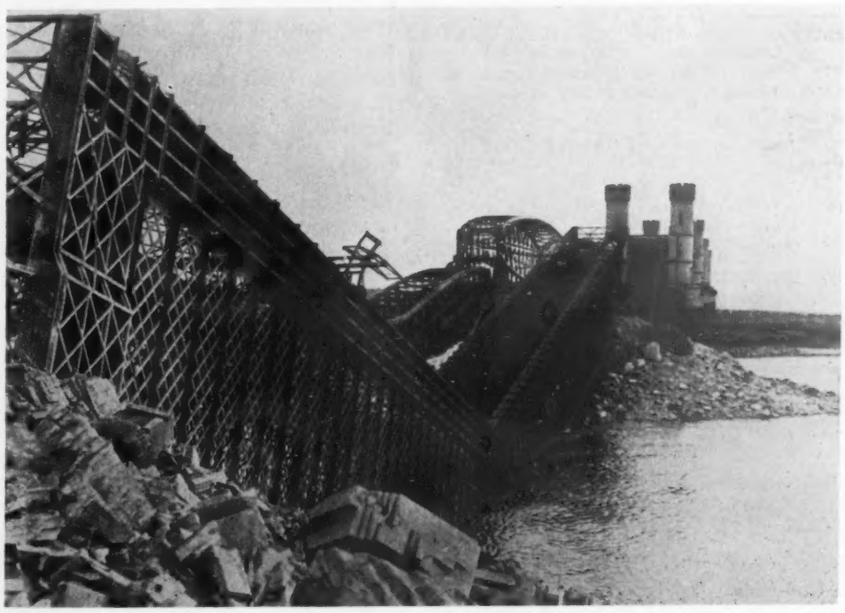
These facts, developed by the American Iron and Steel institute help to explain the increasing volume of foreign inquiries for American steel since the war's outbreak.

Total steel tonnage exported by England, France, Germany and Poland from January, 1936, through June, 1939, was nearly four times the amount of steel exported from the United States in the same period.

Germany, of the belligerents, has been the largest steel exporter, exports since 1936 amounting to 45 per cent of the total tonnage of steel exported from the four countries. England exported 30 per cent of the total, France 21 per cent and Poland 4 per cent.

Average annual exports of steel from neutral steelmaking nations outside of this country have not exceeded 70 per cent of the average annual exports by belligerents.

Steel in Poland



■ Inevitable aftermath of war is lengthy, expensive but vital reconstruction of damage wrought intentionally and in haste. Germany claims retreating Polish troops blasted this steel railway bridge which spanned the Weichsel river, in a vain effort to halt advance of Nazi invaders. NEA photo

Gain Not "All War Inflation"

■ IMPRESSIVE as has been the rise in steelworks operations, from 52.61 per cent of capacity for July to 72.41 for September, the rate has not yet reached the peak of 1937, though rapidly approaching it. Last week the rate was 87.5.

In the first nine months, 1937 the industry averaged above 83 per cent. For three successive months, March, April, May, the average was 89.66 per cent.

	Per Cent		Per Cent
Jan., 1937	81.32	July	78.48
Feb.	84.27	Aug.	83.83
March	89.94	Sept.	76.30
April	90.25	Oct.	58.31
May	88.79	Nov.	38.23
June	74.48	Dec.	25.37

Operations in the year 1938 averaged only 39.79 per cent, and for the first eight months of 1939, 53.80.

Basic recovery was progressing vigorously before the war in Europe set off the wave of anticipatory buying. An uptrend which developed during the summer and which promised to continue through fall indicates the present rush of business is not entirely the result of war.

With August operations at 62.58 per cent, steel company statisticians predicted—before war started—that September would show a peak of 70 per cent, and a higher rate would be attained for the fourth quarter. This was based on assumption customers would continue hand-to-mouth buying.

Numerous factors not related to the war presaged more active steelmaking this fall. Automotive demands were certain to increase as 1940 model production got underway. Railroads had planned to purchase additional equipment to meet the anticipated upturn in carloadings. The carriers' programs were stepped up sharply as result of war conditions, but issuance of in-

vitations for bids early in September indicated specifications had been drawn up before the war started. Shipbuilding was active and taking substantial steel tonnages regularly. This program also was accelerated after war started.

Large tonnages of structural and reinforcing steel were required on contracts already let. Machine tool orders had held at more than double the 1926 average through every summer month. National defense preparations and government projects were requiring substantial tonnages of steel.

Steel payrolls and employment had increased steadily since spring; August payrolls were the highest in nearly two years. Shipments of manufactured products — all industries—in August were 14 per cent above July.

While these indexes indicate a substantial improvement in business would have occurred in September even if war had not been declared, the ratio of war to domestic business is a mooted topic. Steel producers find less than 10 per cent of current production reflects war trade. The remainder represents improved fall requirements, plus buying as a price and delivery protection measure.

Another significant sidelight on the situation is the increased buying from warehouses, fabricators needing immediately material they are unable to obtain direct from mills.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Oct. 7	Change	Same week 1938	Same week 1937
Pittsburgh ..	83	+ 4	37	62
Chicago	86	+ 2	44.5	65
Eastern Pa...	64	+ 3	33	55.5
Youngstown..	90	+ 4	55	60
Wheeling	93	+ 5	54	74
Cleveland ...	89	+ 1.5	51	63
Buffalo	83.5	+11.5	51	70
Birmingham..	86	None	57	77
New England	100	None	65	65
Cincinnati ..	84	+ 5.5	43	70
St. Louis.....	72	None	45.5	60
Detroit	100	+ 1	72	92
Average....	87.5	+ 3.5	48.5	66

PRODUCTION

■ STEEL ingot production advanced 3.5 more points last week to 87.5 per cent. With some plants scheduled to start additional steelmaking units this week, a further increase is indicated. The current rate is the highest since May, 1937, and is 25.5 points better than a month ago. Compared with 1938 week the gain is 39 points. Nine of 12 districts scored increases last week.

Pittsburgh — Up 4 points to 83 per cent, with further improvement in sight.

Chicago — Advanced 2 points to 86 per cent. All mills but one are running 90 per cent or better.

Central eastern seaboard — Rose 3 points to 64 per cent, and is expected to go higher.

Youngstown — Averaged 90 per cent, up 4 points, as three companies added a total of four open hearths. The rate this week may rise to 94 per cent, highest since 1929, provided sufficient pig iron is available.

Wheeling — Up 5 points to 93 per cent, with most plants at capacity.

Cleveland — Increased 1.5 points to 89 per cent. A further small increase indicated for this week will raise all available plants to capacity.

Buffalo — Soared 11.5 points to 83.5 per cent. At close of week the rate was 88.5 per cent.

Birmingham — Unchanged at 86 per cent but will rise to 90 per cent this week.

New England — Held at 100 per cent. At least one furnace will go down for repairs in about ten days.

Cincinnati — Expanded 5.5 points to 84 per cent, new peak for the year.

St. Louis — Remained at 72 per cent, with unchanged or better schedules indicated for this week.

Detroit — Continued at 100 per cent, all furnaces being pushed to their limit.

Steel Ingot Statistics

	Calculated Monthly Production—All Companies —Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	—Total— Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
1939	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.....	3,026,710	54.96	147,642	27.26	3,174,352	52.48	716,558	4.43
Feb.....	2,792,267	56.15	196,382	40.16	2,988,649	54.72	747,162	4.00
March.....	3,210,481	58.30	194,889	35.99	3,405,370	56.30	768,707	4.43
April.....	2,768,269	51.91	205,977	39.28	2,974,246	50.78	693,297	4.29
May.....	2,752,549	49.98	170,326	31.45	2,922,875	48.32	659,791	4.43
June.....	2,937,622	55.08	187,666	35.78	3,125,288	53.35	728,505	4.29
July.....	2,932,924	53.38	229,610	42.49	3,162,534	52.40	715,505	4.42
Aug.	3,516,219	63.85	247,199	45.65	3,763,418	62.22	849,530	4.43
Sept.	3,933,885	73.94	297,425	46.84	4,231,310	72.41	988,624	4.28
9 mos.....	27,870,926	57.49	1,877,116	39.37	29,748,042	55.86	762,770	39.00
1938	**Reported by Companies which in 1938 made 98.67% of Open-Hearth and 99.90% of Bessemer.**							
Jan.....	1,634,224	30.28	99,941	18.27	1,734,165	29.17	391,459	4.43
Feb.....	1,572,009	32.26	125,443	25.39	1,697,452	31.63	424,363	4.00
March.....	1,846,517	34.21	157,687	28.82	2,004,204	33.72	452,416	4.43
April.....	1,786,942	34.19	132,100	24.93	1,919,042	33.34	447,329	4.29
May.....	1,669,455	30.93	131,422	24.02	1,800,877	30.30	406,519	4.43
June	1,513,715	28.96	119,128	22.48	1,632,843	28.36	380,616	4.29
July.....	1,846,319	34.29	127,998	23.45	1,974,317	33.29	446,678	4.42
Aug.	2,340,363	43.36	196,739	35.96	2,537,102	42.68	572,709	4.43
Sept.	2,440,192	46.80	206,937	39.15	2,647,129	46.09	618,488	4.28
9 mos.....	16,649,736	.....	1,297,395	.....	17,947,131	.....	460,183	39.00
Oct.	2,882,827	53.41	223,158	40.78	3,105,985	52.25	701,125	4.43
Nov.	3,357,167	64.23	201,196	37.97	3,558,363	61.81	829,455	4.29
Dec.	2,971,834	55.19	158,912	29.11	3,130,746	52.79	708,314	4.42
Total.....	23,861,564	40.71	1,880,661	29.20	27,742,225	39.65	532,072	52.14

Percentages of capacity operated for 1939 are calculated on weekly capacities of 1,243,153 gross tons open-hearth ingots and 122,248 gross tons bessemer ingots; total, 1,365,401 gross tons; based on annual capacities as of Dec. 31, 1938, as follows: Open-hearth ingots, 64,817,994 gross tons; bessemer ingots, 6,374,000 gross tons.

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots; total, 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Ingot Output Up 12.4 Per Cent

■ SEPTEMBER steel ingot production totaled 4,231,310 gross tons, highest monthly output since September, 1937, and an increase of 12.4 per cent over revised August figure. In September, 1938, 2,647,129 tons were produced.

September production was at 72.41 per cent of theoretical capacity, compared with 62.22 per cent in August, and 46.09 per cent in September, 1938. Average weekly production in September was 988,624 tons, against a revised figure of 849,530 tons in August, and 618,488 tons in September last year.

September's increase over August in total production, 467,892 tons, was less than the increase from July to August, 600,884 tons. Weekly production, however, rose 139,094 tons in September over August, compared with 134,025 tons from July to August.

Nine months' production was 29,748,042 tons, greater than output for the entire year 1938. In the first nine months last year, 17,747,131 tons were made.

31 Blast Furnaces Started in Month; Sharpest Rise in 17 Years

■ THIRTY-ONE blast furnaces were added to the active list in September. Total number of stacks making coke pig iron in the United States Sept. 30 was 169, compared with 138 on Aug. 31, the increase being the largest for any month since September, 1922, when 46 resumed.

The September total, incidentally, was the highest for any month since September, 1937, with 181. The upswing in activity apparently has not yet reached a peak, for several additional furnaces are known to have blown in since Oct. 1.

September output of iron, however, did not correspondingly reflect the increased stack activity, because a considerable number of units went in late in the month. Average daily output was 95,757 gross tons, 9934 tons, or 11.6 per cent, more than the August average of 85,823 tons. It was highest since September, 1937, when output averaged 113,932 tons daily. The September, 1938 average was 56,103 tons.

Total output in September was 2,872,649 tons, 212,136 tons, or 8 per cent, above August's 2,660,513 tons. This was the highest total since October, 1937, with 2,891,026 tons. It compares with 1,683,097 tons made in September a year ago.

Output for first nine months of 1939 amounted to 20,410,329 tons, 8,087,544 tons, or 65.6 per cent, over the 12,322,785 tons made in the period in 1938. First nine months of 1937: 30,307,708 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1939	1938	1937
Jan.	2,175,423	1,444,862	3,219,741
Feb.	2,060,183	1,306,333	3,020,006
March	2,393,255	1,470,211	3,470,470
April	2,055,326	1,388,008	3,400,636
May	1,717,522	1,260,937	3,545,180
June	2,119,422	1,060,747	3,115,302
July	2,356,036	1,213,076	3,501,359
Aug.	2,660,513	1,495,514	3,616,954
Sept.	2,872,649	1,683,097	3,417,960
Tot. 9 mo.	20,410,329	12,322,785	30,307,608
Oct.	.....	2,067,499	2,891,026
Nov.	.....	2,286,661	2,007,031
Dec.	.....	2,212,718	1,503,474
Total	.....	18,889,663	36,709,139

AVERAGE DAILY PRODUCTION

Gross Tons

	1939	1938	1937	1936
Jan.	70,175	46,608	103,863	65,461
Feb.	73,578	46,655	107,857	63,411
March	77,201	47,426	111,951	66,004
April	68,511	46,267	113,354	80,316
May	55,404	40,675	114,360	85,795
June	70,647	35,358	103,843	86,551
July	76,001	39,131	112,947	83,735
Aug.	85,823	48,242	116,676	87,475
Sept.	95,757	56,103	113,932	90,942
Oct.	.....	66,694	93,259	96,509
Nov.	.....	76,222	66,901	98,331
Dec.	.....	71,378	48,499	100,813
Ave.	74,764	51,752	100,573	83,832

Relating production to capacity, operations in September averaged 69.7 per cent, highest since September, 1937, when the rate was 83.7 per cent. A year ago it was 40.5 per cent.

Nearly 75 per cent of the country's 235 potential stacks are now in operation. In September, one steelworks furnace was made inactive while seven merchant and 25 steelworks units were blown in. A year ago, 97 stacks were active. August total was 138; July, 130; June, 117; May, 106, and April, 102.

Furnaces blown in during September were: In Alabama: Woodward No. 3, Woodward Iron Co. North Birmingham No. 3 and No. 4, Sloss-Sheffield Steel & Iron Co. Pioneer No. 2, Republic Steel Corp. In Colorado: Minnequa "A," Colorado Fuel & Iron Corp. In Illinois: South Works Old No. 1 and South Works New No. 9, Carnegie-Illinois Steel Corp. Federal "B," Interlake Iron Corp. One South Chicago, Wisconsin Steel Co. In Indiana: Gary No. 2 and No. 8, Carnegie-Illinois Steel Corp. Indiana Harbor No. —, Youngstown Sheet & Tube Co. In Michigan: One Benson, Ford Motor Co. In New York: One Buffalo, National Steel Corp. In Ohio: Brier Hill No. 2 and Campbell No. 4, Youngstown Sheet & Tube Co. Lorain No. 3, National Tube Co. Mingo No. 3 and Ohio No. 5, Carnegie-Illinois Steel Corp. Hamilton No. 1, Hamilton Coke & Iron Co. Youngstown No. 4, Republic Steel Corp. In Pennsylvania: Monongahela No. 1, National Tube Co. Bethlehem "E" and Cambria "E," Bethlehem Steel Co. Carrie No. 1 and No. 2, Clairton No. 2, Duquesne No. 1 and No. 2, and Farrell No. 2; Carnegie-Illinois Steel Corp. Eliza No. 1, Jones & Laughlin Steel Corp. One Perry, Interlake Iron Corp.

Stack made inactive was: In Colorado; Minnequa "E," Colorado Fuel & Iron Corp.

SEPTEMBER IRON PRODUCTION

	No. in blast last day of Sept.	Aug.	Total tonnage Merchant	Nonmerchant
Alabama	18	14	88,865*	131,127*
Illinois	12	8	22,911	205,327
New York	10	9	48,202	153,260
Ohio	41	34	78,177	599,444*
Penna.	52	41	70,221*	763,368*
Colorado	2	2		
Indiana	14	11	13,085*	476,022
Maryland	6	6		
Virginia	1	1		
Kentucky	2	2		
Mass.	1	1		
Michigan	5	4		
Minnesota	1	1	21,957	200,683
Missouri	0	0		
Tenn.	0	0		
Utah	1	1		
West Va.	3	3		
Total	169	138	343,418*	2,529,231*

*Includes ferromanganese and spiegeleisen.

RATE OF FURNACE OPERATION

(Relation of Production to Capacity)

	1939[1]	1938[2]	1937[3]	1936[4]
Jan.	51.0	33.6	76.6	48.2
Feb.	53.5	33.6	79.5	46.4
March	56.1	34.2	82.5	48.5
April	49.8	33.4	83.7	59.1
May	40.2	29.4	84.3	63.1
June	51.4	25.5	76.6	63.6
July	55.0	28.2	82.9	61.5
Aug.	62.4	34.8	85.7	64.3
Sept.	69.7	40.5	83.7	66.9
Oct.	....	48.0	68.4	71.0
Nov.	....	55.0	49.3	72.3
Dec.	....	51.4	35.6	74.2

[1] Based on capacity of 50,198,920 gross tons, Dec. 31, 1938; [2] capacity of 50,606,400 gross tons, Dec. 31, 1937; [3] first half on capacity of 49,512,737 tons, Dec. 31, 1936 —second half on capacity of 49,727,737 tons, June 30, 1937; [4] capacity of 49,777,893 tons, Dec. 31, 1935. Capacities by American Iron and Steel Institute.

What's New at Pittsburgh . . .

By R. L. HARTFORD
Pittsburgh Editor, STEEL

■ NEED for additional cold-rolling capacity in this district, recognized before the current upturn, now is becoming urgent, and a number of companies are planning to install new cold mill equipment.

Among projects already out for bids are a 5-stand tandem 42-inch continuous cold mill and two 2-stand 42-inch temper pass mills for Irvin works, Carnegie-Illinois Steel Corp. It is understood these mills will use heavier drives and permit higher speeds than present units.

The company is also considering cold mill expansion at its Gary works. Studying a similar program is another United States Steel unit, Tennessee Coal, Iron & Railroad Co.

Rush to expand cold mill capacity here is due largely to the jam in tin plate orders. Long has it been obvious that present facilities can care for normal needs only and any abnormal demand would bring a tie-up. Combination of depleted plate stocks in domestic lines and the sudden rise in export business resulted in the expected bottleneck.

Other mills are seeking to relieve this pressure. Weirton Steel Co. is preparing a new 4-stand 42-inch tandem cold mill and a 2-stand 42-inch skin-pass mill. This will tax present hot mill capacity at Weirton, and while present plans call for enlarging and rebuilding the existing mill, it is possible a new hot mill will be the outcome.

Wheeling Steel Corp. will build at its Steubenville, O., plant a 4-stand 55-inch tandem cold mill and a 64-inch skin-pass mill. Company is also rebuilding a skin-pass mill at its Yorkville, O., works, increasing it from one to two stands.

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New Follansbee Mill Planned

Plans apparently are being formulated for construction of a new cold mill at Follansbee, W. Va., plant of Follansbee Bros. Last week in federal court at Pittsburgh it was announced arrangements have been made for an early windup of the company's long fight to refinance and reorganize.

Court granted a two-week postponement of the case. Commitments on all financing are to be prepared and presented Oct. 16. Petition to set aside the present trustees and appoint others under the Chandler act will come up at the same time. As it now stands the reorganization plan provides a loan of $1,850,000 is to be obtained from RFC, an additional $375,000 from banks, and $275,000 from sale of common stock. Approximately $1,200,000 is to be expended for new mill equipment, the balance for current expenses and working capital.

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Studying Induction Heating

Interest again is noted in the adaption of induction heating to pipe production. Extensive work currently is under way in developing a new heating process similar to the high-frequency methods widely used in heat-treating automotive parts.

Previous attempts to employ this process, notably by Youngstown Sheet & Tube Co., are said to have failed due to limitations imposed by the necessity for placing a coil inside the pipe during heating. This restricted the process to large diameter tubing. Problem now is being attacked from a different angle, that of eliminating the internal coil. Early experiments are reported to show considerable promise.

News sidelights here include authorization of a million-dollar bond issue by stockholders of American Bantam Car Co., Butler, Pa., to meet a sharp increase in business.

Small 4-cylinder cars like those built by this company have a ready market abroad, but heretofore needs have been met almost exclusively by European producers. As a result of disruption in manufacture due to hostilities, foreign buyers are turning to the American product.

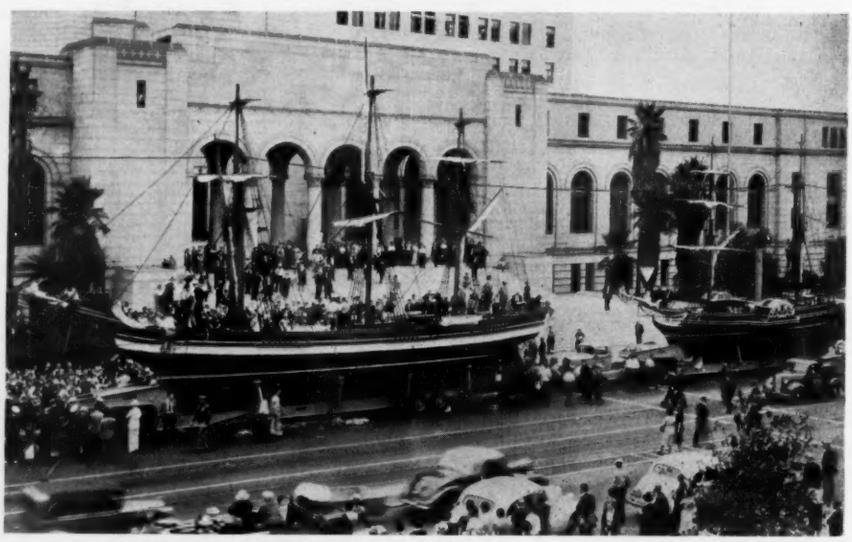
Depreciation Equal to $5 Per Ton of Steel

■ Charges for depreciation and depletion of steel plant equipment and properties averaged nearly $5 per ton of finished steel produced in 1937 and 1938, an increase of nearly 30 per cent over depreciation and depletion charges per ton in 1928-1929, the American Iron and Steel institute has computed.

More rapid obsolescence of steel plant equipment in recent years as a result of technological progress, and the installation of more expensive equipment, have increased the rate at which plants and equipment depreciate. These have been major factors in raising depreciation and depletion charges per ton from $3.85 in the 1928-1929 period to an average of $4.95 in 1937 and 1938. Another factor was the 27 per cent decline in average annual output between those two periods.

An average of $142,700,000 was charged annually for depreciation and depletion in 1937-1938, a reduction of less than 6 per cent from average annual depreciation charges in 1928 and 1929. In the 1928-1929 period, total charges for depreciation and depletion represented 3.9 per cent of the total property value, while in 1937 and 1938, depreciation and depletion charges were equivalent to 4.3 per cent.

Trailers To Haul Clipper Ships 8500 Miles



■ No mean engineering feat is the transporting of these two quarter-scale replicas of oldtime seagoing clipper ships on an 8500-mile movie-promotion tour of the country. Shown in front of Los Angeles city hall before departing, boats are mounted on large Fruehauf steel trailers drawn by White tractor units. Carrying three 60-foot masts, the larger craft weighs 50 tons, is 67 feet long, with 12-foot beam. Both vessels will traverse the Great Lakes under their own power

"Honorable Peace" for United States Urged by Machine Tool Builders

■ THE NATION'S machine tool builders have gone on record as opposed to war. Representatives of the industry attending the 38th annual convention of the National Machine Tool Builders' association in Cleveland, Oct. 2-3, unanimously adopted a resolution to this effect. Text of the resolution follows:

WHEREAS: The members of the Machine Tool Builders' association hold firmly to their conviction that real wealth is created only by the production of those goods and services which add to the possessions and welfare of all the people;

WHEREAS: War is destructive to those benefits to humanity;

THEREFORE, be it resolved: That we, the members of the National Machine Tool Builders' association, assembled in convention at Cleveland, declare ourselves opposed to warfare, and in favor of the maintenance of honorable peace in the United States.

Wendell E. Whipp, president, Monarch Machine Tool Co., Sidney, O., and retiring president of the association, detailed the hazards surrounding acceptance of war orders from foreign countries. He emphasized that destinies of the American machine tool industry are interwoven with destinies of America's domestic manufacturing enterprises, and that the great, lasting and permanent market lies in this country.

"It may be very tempting," he said, "to take the fullest possible advantage of a sudden war-created foreign demand, but if that demand is fulfilled at the expense of American industry, the price that inevitably must be paid will be heavy."

Denies Upturn Is "War Boom"

According to Mr. Whipp, the industries in this country have received within the last month a "psychological kick in the pants which has knocked them off the do-nothing, venture-nothing, buy-nothing seat which they have so long occupied." New ventures, new projects, new undertakings are once more under way. But at the same time we should by all means interpret the present business uplift of the United States not as a war boom, but as a release of the hitherto pent-up productive energies of this country.

Circumstances surrounding the sudden cancellation of the National Machine Tool show following the outbreak of hostilities in Europe were explained by Mr. Whipp. He said:

"The moment war was declared it became apparent that many foreign countries which hitherto had been buying industrial products from European nations now at war would no longer be able to secure those products from such countries. This meant that the United States would inherit a large share of this foreign trade. In addition there was the stimulus derived from the national defense picture within this country. The result was that domestic manufacturers in a large variety of fields—most of them unrelated to direct preparedness for war—suddenly felt that their volume of production would inevitably be increased.

John E. Lovely

Elected president, National Machine Tool Builders' association

"Thousands of these companies had long since been considering the advisability—in fact, the necessity—of installing better and more modern machine tool equipment. The impetus provided by the war situation galvanized delayed machine tool orders into immediate action. A preliminary survey, just completed by our association, indicates that domestic orders for machine tools for the first two weeks of September were actually twice as large as the total for the entire month of August, not to mention the very substantial increase in foreign orders which likewise materialized during this period. With a flood of domestic orders descending upon the machine tool industry, and with machine tool users busy preparing their plants for higher operating schedules, nobody could afford to take 'time out' for the tool show."

Tell Berna, general manager of the association, Cleveland, dealt with the current situation in the following words: "Central Europe had been fading out of our picture anyway, due to currency difficulties. Those nations are now effectively isolated by the British blockade, and machine tools are on both German and British lists of contraband of war. We rejoice at the stimulation of our domestic demand, though we regret that it had to come from war.

"There is a tendency among our members to ration their shipments abroad, setting aside a definite percentage of each month's output for all foreign markets. A sustained foreign demand is the more likely since nations that have been buying German machine tools will now turn to us. Germany exported $42,000,000 worth of machine tools in the first six months of this year."

W. T. Holliday, president, Standard Oil Co. of Ohio, Cleveland, a guest speaker, made the statement that the position taken by American industry is that we can and must stay out of this war. However, he made it clear that this position does not in any way involve any opposition to the President's proposal to amend the neutrality act.

"America Can Keep Out"

Mr. Holliday decried the fact that recent polls of public opinion would seem to indicate that a distressingly large percentage of the people in the United States has gained the idea that inevitably we will be drawn into the war.

"Such a philosophy," he continued, "is a philosophy of despair, a defeatism which if not dispelled may become an affirmative force toward putting us into this war. That philosophy of despair is false. We can keep out of this war if we have the intelligence and the will to do so."

Mr. Holliday remarked that there is a tendency on the part of many people to exaggerate the effect of war orders. Actually, there is nothing in the present situation to justify tremendous optimism. Conditions today are entirely different than they were in 1914. At that time the allies had not been preparing for war nor did they have any great industrial self-sufficiency.

Today, on the other hand, all the warring countries are remarkably self-sufficient. Since 1914 the productive capacity of the world as to practically all basic commodities has increased five or six fold and there is nothing so far to indicate that the extra demands of war will create any scarcity value for such basic materials. Any marked increase in prices is more apt to be of an inflationary character.

"In brief, we should not look to this war as a solution of our domestic recovery problem. We still have

all of our domestic problems and our attention should not be diverted from them. For the sake of recovery, for the sake of our national security, we should concentrate upon our domestic problems and should attempt to solve them in the old fashioned American way, and not in the modern European way."

George A. Bryant Jr., executive vice president of the Austin Co., Cleveland, another guest speaker, described European conditions as he personally observed them within the past few weeks. Both in England and in Germany he detected shortages of skilled labor as well as of certain kinds of manufacturing equipment.

Points to Soviet Inefficiency

In checking up on the Gorki automobile plant in Russia, of which his company built the original unit eight years ago, he found that while the size of the plant has been doubled, production is still far below what it would be in a plant of comparable size in America. American machine tools, he said, are continuing to perform with remarkable efficiency, despite their eight years of extremely hard usage at the hands of workmen who in the beginning possessed little or no skill.

This plant is now turning out about 150,000 motor vehicles a year, with a force of 30,000 workers. Mr. Bryant estimated that under comparable conditions about one-quarter as many American workers would produce the same number of vehicles.

W. P. Kirk, sales manager, Pratt & Whitney division, Niles-Bement-Pond Co., Hartford, Conn., asserted that postponement of the show makes a good salesman more than ever necessary in the machine tool business. A good salesman, according to Mr. Kirk, must now be a combination of engineer, diplomat, prophet, service man and above all a collector of vital information on the exact requirements of the customer's work.

John E. Lovely, vice president, Jones & Lamson Machine Co., Springfield, Vt., was elected president of the association. Other officers named were: First vice president, Frederick V. Geier, president, Cincinnati Milling Machine Co., Cincinnati; second vice president, Clifford S. Stilwell, executive vice president, Warner & Swasey Co., Cleveland. Retiring President Whipp was elected treasurer.

New directors are: H. B. Kraut, president, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.; E. C. Bullard, vice president, Bullard Co., Bridgeport, Conn.; and Mr. Stilwell.

Tell Berna was re-elected general manager and Mrs. Frida F. Selbert secretary of the association.

Domestic Requirements Should Be Supplied First, Tool Dealers Told

■ THE CONFUSING situation for industrial machinery created by the European war was the principal subject considered by the Associated Machine Tool Dealers of America at its annual convention in Cleveland, Oct. 5.

A. G. Bryant, president, Bryant Machinery & Engineering Co., Chicago, and retiring president of the association, pointed out that "the war, far from benefiting the machine tool industry, has come at a time which seriously interferes with the job of handling the present industrial market for machinery. Since the summer of 1938 the curve of machine tool business has been steadily rising as a result of the improved outlook for the automotive, farm equipment and other industries.

"Now with war orders from abroad and demands for increased armament in this country, a sudden heavy load has been placed on builders of machine tools, resulting in prolonging deliveries to normal customers as much as six months to a year, and creating the danger of increased prices . . .

"The machine tool industry, in protecting itself, and as a service to American business, must limit the amount of export sales which it can accept. It must be prepared to handle our own government's requirements for machinery for navy yards and arsenals and to meet with as reasonable delivery service as possible the needs of its regular customers in our own domestic metalworking industries."

Speaking at the dinner, J. R. Weaver, director, equipment, inspection, purchases and test, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and president, American Society of Tool Engineers, urged that machine tool builders and dealers keep in mind the possibility that most of the tools now being shipped abroad will, when the war ends, be switched from munitions manufacturing to production of peacetime products. These will be marketed in competition with similar products made in the United States, and in view of the low wage scales which undoubtedly will continue to prevail in Europe, this is likely to be stiff competition for American manufacturers. Therefore, it behooves American tool builders to see that equipment in this country is not sacrificed at the expense of existing temporary foreign demand.

Mr. Weaver recommended that when conditions are normal or above normal, machine tool prices should be lower than when business is poor. This would be economically justified, he believes, by lower costs resulting from something approaching mass production of tools in good times.

Group Names Officers

John Sauer Jr., Peninsular Machinery Co., Detroit, was elected president of the association; F. B. Scott Jr., Syracuse Supply Co., Syracuse, N. Y., vice president; and George F. Turner, Strong, Carlisle & Hammond Co., Detroit, secretary-treasurer.

Elected to the executive committee for three years were: D. N. Macconel, Machinery Sales Co., Los Angeles; L. H. Pratt, Henry Prentiss & Co. Inc., New York; and G. J. Hawkey, Cleveland Duplex Machinery Co. Inc., Cleveland; and for one year, John P. Tierney, General Machinery Corp., Boston.

MACHINE'S EFFECT DEPICTED AT TOOL ENGINEERS MEETING

About 500 members of the American Society of Tool Engineers assembled in Cleveland, Oct. 6-7, for the semiannual meeting of the association. All of the first day was spent in inspection trips to industrial plants. In the evening a dinner was served at which John M. Younger, professor of engineering, Ohio State university, Columbus, O., and chairman of the association's fact-finding committee on "Effect of Development of the Machine on Employment and on Standard of Living" presented its second annual report.

Principal speaker at the dinner was Hamilton Fish, congressman from New York, discussing "Economic and Political Effects of the Development of the Machine."

A report on this meeting will be presented in next week's issue of STEEL.

■ Unemployment dropped 4.3 per cent during August to the lowest point since December, 1937, estimates the National Industrial Conference board. Number of jobless in August totaled 9,424,000, compared with 9,852,000 in July and 10,601,000 in August, 1938. Lowest point in recent years was reached in September, 1937, when idle workers numbered 5,651,000.

Warning Against Price Inflation Sounded at Distribution Conference

BOSTON

■ WARTIME problems in distribution were reviewed here at the eleventh Boston Conference on Distribution, Oct. 2-3, with nearly 700 attending.

Depicting varied effects of foreign hostilities on America's economy, speakers cautioned retailers to guard against price inflation, warned of possible regulatory measures. Should we become involved in war, mass distribution and modification of antitrust laws would be essential, it was asserted.

Urging private industry be given greater opportunity to regulate itself, several speakers stressed advertising to promote free enterprise. Discriminatory business legislation by states was attacked as hampering the free flow of trade.

Inventories should not be too greatly augmented in fear of advancing prices or future shortage of goods, declared Prof. Oliver M. W. Sprague of Harvard Business school, formerly fiscal adviser to the Bank of England and United States treasury department.

"Today's war will not have the same economic effects which arose during the last world conflict," he pointed out. "This struggle is being conducted on a conscription rather than voluntary basis as regards men, money and supplies. Belligerent governments are not competing with civil demand, rather they practice thorough-going price and profit control."

Countering this view, Dr. H. S. Person, New York, business consultant, sees a repetition of trends of 1914-19, followed by reactions similar to those of 1929-39. Indications that business will experience a sellers' market for some time are not lacking, he stated. "In a sellers' market manufacturers will strive to compensate for lean years, taking advantage of all the traffic will bear, with the result merchandisers will be forced to meet unfavorable consumer reaction. Depression following this war will be more devastating than that from which the country is now emerging," he predicted.

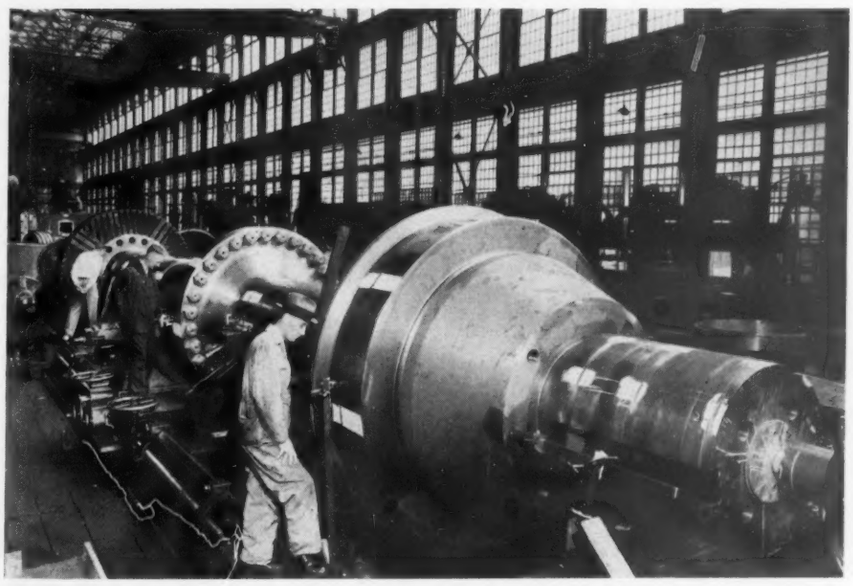
Production of plastics has reached 160,000,000 pounds a year, according to A. E. Pitcher, general manager, E. I. du Pont de Nemours & Co., Wilmington, Del. Plastics, he asserted, "are more closely associated with our daily lives than any other class of industrial materials except food and clothing."

Glass in new and different forms as an aid to retail distribution was discussed by James Slayter, vice president, Owens-Corning Fiberglas Corp., Toledo, O. He described several recent developments, including a new glass cloth, soft, pliable and virtually indestructible.

Flaws in the present system of distribution were characterized as the price paid for economic liberty by Don Francisco, president, Lord & Thomas advertising agency, New York. Economic liberty, he said, implies free enterprise on a competitive basis and the right of the individual to buy what he pleases.

In event of war this government will have to fix the price of raw materials as well as finished goods, of labor as well as capital, of luxuries as well as necessities, declared George J. Feldman, Washington attorney. H. Napier Moore, editor, *McLean's Canadian Magazine*, pointed out American investments in Canada were safe during the last conflict and would be more so this time because of "pay-as-you-go" war financing.

Aligning Huge Generator and Water Wheel Shaft



■ **Alignment of combined generator and water wheel shaft is tested in 10-foot swing lathe in Allis-Chalmers Mfg. Co.'s Milwaukee shops. Three such generators are under construction for Tennessee Valley authority. The 21-foot long, 34-inch diameter shaft section in foreground belongs to the generator and shows the 93-inch diameter thrust block that has been shrunk on; exposed shaft is part on which the huge generator rotor will be attached. Combined sections, as shown, weigh approximately 160,000 pounds, have overall length of 36 feet**

August Steel Payrolls Reach Two-Year High

■ Steel industry's August payrolls were $67,894,000, highest total for any month in nearly two years, according to the American Iron and Steel institute.

Number employed in the industry likewise increased during August to an average of 458,000, an increase of nearly 5000 over the July figure.

Both steel payrolls and employment have increased steadily since late in the spring, monthly payrolls having risen 16 per cent, employment having increased 2 per cent, and average hours per week 12 per cent. Figures for September will show a continuation of the upward trend of the past several months, reflecting the rapid increase in steel output since Labor day.

Steel payrolls in August were substantially above the July total of $59,900,000 and were nearly 30 per cent above August, 1938.

Average for August, 1939, of 458,000 steel employes, compares with 453,000 in July and with 427,000 in August a year ago.

Hourly earnings of wage earners in August averaged 84.7 cents per hour, as against 85.9 cents in July and 83.2 cents in August, 1938.

Average number of hours worked weekly by wage earners averaged 36.2 in August, as against 31 in July and 29.4 in August a year ago.

August Steel Imports Lower

■ IRON AND STEEL imports into the United States during August, excluding scrap, decreased in volume to 24,599 gross tons, but rose in value to $1,354,288, according to the metals and minerals division of the bureau of foreign and domestic commerce. July imports amounted to 27,516 tons valued at $1,285,390, and in August, 1938, totaled 18,404 tons valued at $1,182,741.

Principal product imported in August was structural shapes, Belgium supplying 3606 tons and France 1144 tons of the 4770-ton total. Pig iron was second with a total of 3204 tons of which 2211 tons was obtained from British India and 993 tons from Canada.

With large shipments of structural shapes, bars and hoops Belgium ranked first as a purveyor of iron and steel to the United States in August. Germany was second with a total trade amounting to 3324 tons, of which cotton ties was the principal individual product. France, Norway, Sweden and Canada followed in order.

Scrap imports were somewhat higher at 3729 tons, compared with 3335 tons in July and the 1637 tons in August, 1938. Canada was, as usual, the chief source of supply with shipments totaling 3318 tons. The remainder came from the United Kingdom and Sweden.

U. S. FOREIGN TRADE IN IRON AND STEEL, INCLUDING SCRAP

Gross Tons

	1939		1938	
	Exports	Imports	Exports	Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	359,690	19,149	460,640	19,589
March	474,360	25,369	526,883	11,827
April	394,008	44,083	489,202	21,237
May	532,641	28,142	540,639	20,814
June	588,856	32,587	312,021	15,887
July	513,664	30,851	263,699	14,728
Aug.	477,078	28,328	242,139	20,041
Sept.	.....	.....	346,068	27,958
Oct.	.....	.....	425,431	26,445
Nov.	.....	.....	469,596	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

ORIGIN OF AUGUST IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	7,891	.....	.....	1,967
Sweden	36,818	.....	.....	.....
United Kingdom	19	.....	.....	.....
Canada	465	993	2	.....
Mexico	62	.....	.....	.....
Cuba	21,597	.....	3,272	.....
Chile	145,700	.....	.....	.....
China	10	.....	.....	.....
British India	.....	2,211	.....	.....
Brazil	.....	.....	3,585	.....
Soviet Russia	.....	.....	1,548	.....
Morocco	.....	.....	15	.....
Gold Coast	.....	.....	9,626	.....
France	.....	.....	.....	109
Netherlands	.....	.....	.....	39
Yugoslavia	.....	.....	.....	240
Total	212,562	3,204	18,048	2,355

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	6	3,606	1,390	1,603
United Kingdom	8	.....	17	.....
Canada	5	.....	2	.....
Sweden	3	.....	359	1
France	.....	1,144	316	406
Germany	.....	20	79	....
Total	22	4,770	2,163	2,010

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

(Gross Tons)

Articles	Aug. 1939	July 1939	Jan.thru Aug.'39
Pig iron	3,204	6,189	25,247
Sponge iron	244	107	1,222
Ferromanganese (1)	2,355	1,985	22,848
Spiegeleisen	1,007	3,873	18,849
Ferrochrome (2)	.....	18	111
Ferrosilicon (3)	93	78	967
Other ferroalloys (4)	38	30	200
Steel ingots, blooms, etc.	7	.....	11
Billets, solid or hollow	29	20	254
Concrete reinforc. bars	330	20	2,330
Hollow bar and drill steel	129	206	971
Bars, solid or hollow	2,163	1,406	14,023
Iron slabs	.....	.....	.....
Iron bars	34	88	435
Wire rods	775	727	6,513
Boiler and other plate (including skelp)	1	1	21
Sheets, skelp and saw pl.	22	243	1,298
Die blocks or blanks, etc	.....	.....	80
Tin plate, tagger's tin and terne plate	5	1	42
Structural shapes	4,770	4,867	35,512
Sashes and frames	.....	.....	5
Sheet piling	.....	.....	462
Rails and track material	222	271	4,720
Cast iron pipe and ftgs.	295	14	696
Mall. iron pipe fittings	4	6	112
Welded pipe	363	278	4,263
Other pipe	441	131	24,818
Cotton ties	2,939	2,310	6,322
Other hoops and bands	2,010	1,556	14,456
Barbed wire	1,621	1,612	13,491
Round iron and steel wire	209	97	1,604
Teleg. and telephone wire	5	.....	7
Flat wire and steel strips	309	238	2,117
Wire rope and strand	113	141	1,309
Other wire	103	82	1,301
Nails, tacks and staples	614	838	6,355
Bolts, nuts and rivets	13	3	79
Horse and mule shoes	62	42	307
Castings and forgings	70	30	948
Total	24,599	27,516	214,306
Iron and steel scrap	3,729	3,335	21,867
GRAND TOTAL	28,328	30,851	236,173

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

U. S. Steel Considers Steelworks in Brazil

■ United States Steel Corp. representatives and the Brazilian government are studying possibilities for constructing a new integrated steelworks in the South American republic. Study contemplates a plant to manufacture rails and light steel products for use in South America, would involve improvement of a government-owned railroad, erection of blast furnace, open hearths and rolling mills, the obtaining of cheap coal and a guarantee by the Brazilian government against future expropriation.

Corporation officials and a mission of the Brazilian government have been investigating the ore situation and other problems. Lack of coal near the seaboard and a shortage of transportation facilities are understood to be major obstacles.

The joint commission is expected to report to Brazil's President Getulio Vargas about Nov. 1.

The plant, if built, is reported to involve expenditures of about $30,000,000 and would have 300,000 tons annual capacity.

MEETINGS

HARDWARE GROUPS ARRANGE ATLANTIC CITY PROGRAMS

■ A WIDE range of subjects, including economic conditions and distributor-dealer relationships, will be considered at the forty-fifth annual convention of the National Wholesale Hardware association at the Marlborough-Blenheim, Atlantic City, N. J., Oct. 16-19. Important addresses include: "Wages of Taxation," by Fitzgerald Hall, president, Nashville, Chattanooga & St. Louis railway, Nashville, Tenn.; "Increasing the Line Value of Orders," by O. W. Ahl, Hibbard, Spencer, Bartlett & Co., Chicago; and "Improving the Wholesaler-Retailer System," by John M. Holmes, Holmes Hardware Co., Pueblo, Colo.

National Association of Sheet Metal Distributors, an affiliate of the Hardware group, will hold its annual meeting on Oct. 17. E. L. Shaner, editor-in-chief of STEEL, Cleveland, will discuss "Distribution Under Existing Conditions"; and Flint Garrison, publisher, *Garrison's Magazine*, New York, will speak on "Conserving Our Greatest Asset."

The American Hardware Manufacturers' association will hold its annual meeting at the same place and time.

NATIONAL FOUNDERS WILL CONVENE IN NEW YORK

Annual meeting of the National Founders association is announced for Nov. 15-16 at the Waldorf-Astoria hotel, New York. Results of the special session of congress, effect of the European war on American economy, present status and immediate future of manufacturing, and the national labor relations act investigation, are among special subjects to be discussed.

MANAGEMENT GROUP PLANS PRODUCTION CONFERENCE

How American industry can meet its problem of controlling unit costs through more efficient plant facilities as it becomes the world's remaining big-scale producer of goods will be the theme of a conference sponsored by the Production division, American Management association, Oct. 15-16, at the Palmer House, Chicago. Program is being arranged by Raymond S. Perry, vice

president, Ingersoll Milling Machine Co., Rockford, Ill., and vice president of the division.

Special stress is to be placed upon factory design and modernization as a factor in cost reduction. Specific subjects include: building design as a factor in production efficiency; plant services and unit costs; "plants of tomorrow" in operation today; lighting for production; heating, ventilating and air conditioning; effects of environment on employes.

FALL MEETING OF STEEL FOUNDERS IN HOT SPRINGS

Steel Founders' Society of America will conduct its fall meeting at Hot Springs, Va., Oct. 12-13. Headquarters will be at the Homestead.

FINANCIAL

WOODWARD'S NINE MONTHS PROFIT $387,848

■ WOODWARD IRON CO., Woodward, Ala., reports nine months net profit of $387,848, equal to $1.43 a share on 271,178 shares of capital stock. In the comparable period last year net profit totaled $303,696, or $1.12 a share on 270,430 shares. The indicated net profit for the September quarter was $150,798, equal to 56 cents a share. In the same quarter last year net profit totaled $42,735, or 16 cents a share, while in the June, 1939 period earnings were $56,929, or 21 cents a share.

CARPENTER STEEL HAS NET PROFIT FOR YEAR

During the fiscal year ended June 30, Carpenter Steel Co., Reading, Pa., had a net profit of $317,309, equal to 88 cents a common share. In the preceding year net profit totaled $246,590, or 68 cents a share. Net sales for the year amounted to $5,251,801, an increase of 6.2 per cent over sales volume of $4,944,856 in the preceding year.

Sloss-Sheffield Now Making Ferromanganese

■ Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., last week announced that beginning Oct. 1 it started to manufacture ferromanganese for the market, and plans to produce about 30,000 tons annually. One of its blast furnaces will be devoted to this production.

"This is not a war-born project," a company official told STEEL, "as we have had it under consideration for some months."

Arrangements have been made for obtaining ore from Cuban sources. Imports of standard ferromanganese in 1938 totaled about 21,125 tons (manganese content), coming chiefly from Norway, Holland and Czechoslovakia. In 1937 this country imported about 23,888 tons.

Labor Department Erred in Steel Wage Case, Appeals Court Rules

WASHINGTON

■ FIRST broad court interpretation of the Walsh-Healey government contracts act last week was favorable to small eastern steel producers who had contended the secretary of labor exceeded her authority in determining minimum wages for the industry.

By a two to one decision the District of Columbia court of appeals remanded the appeals of Lukens Steel Co., Coatesville, Pa., Allen Wood Steel Co., Conshohocken, Pa., South Chester Tube Co., Chester, Pa., to the district court.

Decision was based on the suit brought by a group of small producers in the eastern area after the labor department had established 62½ cents as the minimum wage to be paid in eastern states. Wages were never put into effect because court restrained the labor department. Court's action was announced early in August (STEEL, Aug. 7, p. 27) but the full decision was not released until last week.

Government May Appeal

Labor department has not yet indicated what action it will take, but many Washington observers believe government will appeal case to the Supreme Court. Two other procedures by the labor department are possible. One would be to ask the court of appeals for rehearing, which it probably would not grant, and the other would be to go ahead with the hearing of the case itself before the district court as suggested by the court of appeals.

Associate Justice Miller, who wrote the majority opinion, upheld the contention of the steel mills that the labor department's decision was "arbitrary and capricious". Department's employment of the word "locality" to describe an area consisting of 13 states, a portion of another, and the District of Columbia "is not only unwarranted but incongruous."

Dealing with the word "locality" which was stressed at the hearings, majority opinion says: "It is true that the word 'locality' is one of somewhat indefinite meaning. Still, its indefiniteness has certain well recognized limits in common meaning and usage which exclude and forbid the interpretation placed upon the word by the appellees in their determination."

Justice Miller said also in his opinion that "congress obviously had in mind a local center of manufacturing when using 'locality'". To permit the secretary of labor to establish a minimum wage scale for the area embraced within 14 states and the District of Columbia "would be to defeat rather than to accomplish the purpose of the act. Under the circumstances it is not necessary to look farther to discover the legislative intent."

Justice Miller further states the contention of the labor department is "without merit", that its activities in connection with this law are not subject to judicial review because the minimum wage decision is a mere "finding".

"It is true," said the court, "that within proper limits of the meaning of 'locality' the secretary of labor is required by the statute to exercise judgment and discretion, but the determination in this case goes so far beyond any possible proper application of the word as to defeat its meaning and to constitute an attempt arbitrarily to disregard the statutory mandate."

Majority opinion in which Justice Vinson concurred, upheld the contention of the steel companies that the law "contains no adequate administrative remedy to meet the grievances alleged," and that the minimum wage order is detrimental to the small steel companies.

Majority opinion concluded: "The case is therefore remanded to the district court which is instructed to set aside and vacate its previous order dismissing the complaint and is directed to proceed in accordance with the opinion of this court."

Holds Suit Is Against U. S.

Justice Edgerton in a dissenting opinion said: "I think we need not determine whether appellants or appellees are right as to the meaning of 'locality' for I think that even if appellants are right on that point their bill was properly dismissed for several reasons."

Justice Edgerton maintained the suit is in substance against the United States and therefore "not maintainable without its consent." He adds that such suits "would operate to disturb the whole contracting system of the government," and that a judgment in favor of the appellants will control the terms on which the United States may enter into contracts for the necessary works of the departments of labor, war, navy, treasury, interior, and post office.

Windows of WASHINGTON

By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ INDUSTRIAL mobilization plans are progressing rapidly through war and navy departments with emphasis on experimental and other orders. War department is withholding names of the firms to which some 10,000 orders for 70,000 war items recently have been sent.

Under the plan formulated by the army and navy munitions board, 9431 of the orders have gone out for supplies to the army and 909 for naval supplies.

Breakdown of figures for the entire country shows a triangle with its angles at Pittsburgh, Boston and Wilmington, Del., will bear at least 60 per cent of the load of manufacturing war supplies.

Of the 70,000 items which would be needed immediately by the country's armed forces in case of war, 2700 are considered by military experts as difficult to get and 55 of these are considered critical.

Under two congressional appropriations of $2,000,000 and $14,500,000, these 55 are now being made by picked firms on an experimental basis, so that in the event of an emergency techniques in manufacturing them will be as nearly perfect as possible. With the exception of the 55, all orders are sealed and not to be opened until notification by the army and navy.

"WATCH PRICES," PRESIDENT ASKS ECONOMIC COMMITTEE

Temporary national economic committee was asked last week by the Chief Executive to watch the price situation. Apparently the administration will not ask congress for price control laws now.

Senator O'Mahoney, committee chairman, pointed out the committee now is studying prices and has had them under survey since the committee began its work. The President's letter to the committee:

"We all know, from the experience following 1914, the dangerous dislocations to American economic life which may occur, as a result of profiteering, when there is a war in Europe. As I see it, the TNEC is well qualified to invoke the forceful check of impartial public inquiry on this kind of unAmerican activity, and I was, therefore, much interested in your remarks on that subject at the TNEC hearings on Sept. 25. All of us, of course, want to see producers, middlemen and retailers receive fair prices for what they sell, and all of us recognize that, in certain fields, such fair prices are probably not as yet being received. But none of us wants to see the cost of living unjustifiably increased or prices become so unreasonably high as to interfere with our national defense.

"It seems to me, therefore, that during this period, the TNEC might well keep a constant eye on increases in prices of our basic materials and, in the light of past and present circumstances, study the facts to determine whether there is profiteering, or whether such increases are legitimate. I agree with you that such constant surveillance is clearly in keeping with the purposes and objectives for which the TNEC was established, and I believe that, in carrying forward such a program, your committee can well become an important part of our first line of national defense against ugly and inhuman greed."

HOUSE GROUP WANTS TAX ON WAR PROFITS

Several members of the house who favor immediate legislation levying an excess profits tax on firms dealing with belligerents conferred with President Roosevelt last week.

Although heartily in favor of preventing abnormal war profits, the President said the excess tax question needed more study. He asked the group to talk with treasury, justice, and commerce departments and securities and exchange commission officials.

Mr. Roosevelt said he knew of no one who had made abnormal profits in the last month. He told the congressmen that after the neutrality question had been settled, they might talk with him again.

The house group, led by Representative Voorhis, California, is endeavoring to have excess profits tax legislation passed at the special session to prevent American concerns from making large profits from selling arms and munitions to belligerents. They want to see such legislation brought forward as a companion bill to the arms embargo measure.

The impression prevailed that the President would oppose the idea. The congressmen, after talking with him, were optimistic. One member said the group discussed with the President the question whether an excess profits tax might be made retroactive.

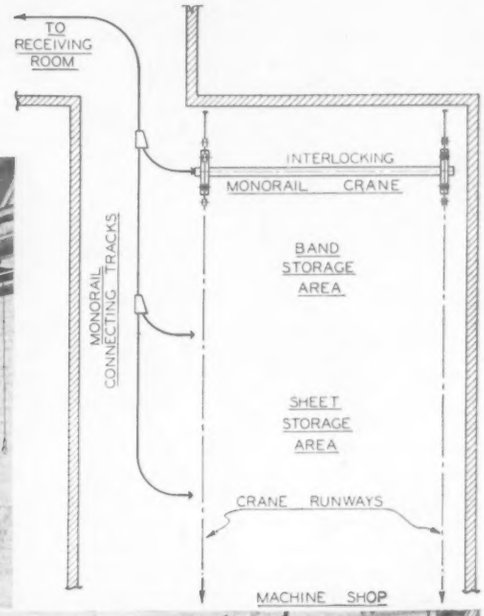
ANTIPROFITEERING BILL URGED BY CALIFORNIAN

A bill introduced in the house last week by Representative Voorhis, California, and referred to the committee on ways and means, seeks to prevent profiteering in war munitions.

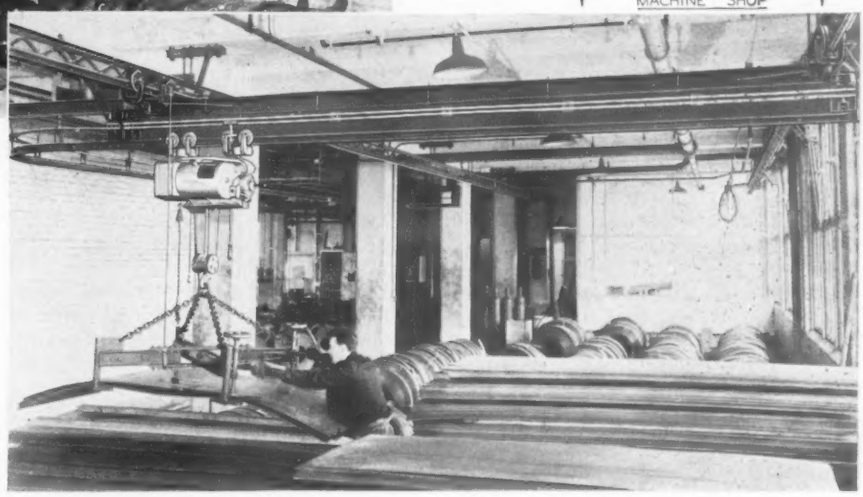
Bill provides for an excess profits tax equal to 80 per cent of all net profits in excess of the average net profit realized in the 24 months immediately preceding the act's passage. On corporations "in the business of manufacturing, exporting, or dealing in arms, ammunition, or implements of war" the bill provides further "in computing net profits such persons, partnerships, companies, associations, and corporations shall include therein all increased payments whether in cash or otherwise to any person whose

Low-cost Handling System

Steel moves from receiving dock to storage over this simple American MonoRail system at low handling cost.

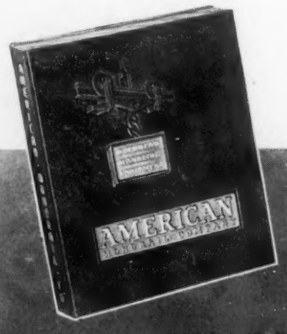


Special coil hook, electric hoist, crane and connecting tracks make up a system that permits one-man control of the entire stock.



Manually operated sheet grab assures safe handling of unit loads direct to process machines, eliminating damage or re-handling of individual sheets.

A 254 page book used as a technical reference for all data covering Mono-Rail equipment will be sent on letterhead request.



Since no two overhead handling problems are alike, low-cost solutions are found only in a system that offers extreme flexibility of basic design.

American MonoRail equipment meets varying requirements at low initial cost because standard parts of such flexible design are fabricated into special units and co-ordinated into systems guaranteed to produce the results intended.

For either manual, electric or automatic operation these systems invariably overcome operating congestion, eliminate costly maintenance and reduce handling expense wherever applied. Engineering consultation is available without obligation.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE • CLEVELAND, OHIO

total compensation amounts to $10,000 per year or more."

GUARD AGAINST ABRUPT EXPORT PRICE INCREASES

A group of representatives of American import and export organizations indicated belief last week that prices of goods sold in Latin American markets will be governed by domestic price conditions and that there will be no effort to make unwarranted price increases, according to Under Secretary of Commerce Edward J. Noble.

Question of prices was one of the first matters taken up at a conference on Latin American trade called by Secretary of Commerce Harry L. Hopkins. It was brought before the conference by the action of the pan-American conference in Panama in formally requesting all industrial and business organizations in the western hemisphere to take due care that prices are not boosted unjustifiably as a direct result of war conditions abroad.

Mr. Noble said: "The general opinion of the conference was that no definite position could be taken by the American foreign trader in reference to the so-called 'British Blacklist' of foreign importing agencies until such blacklist was formally presented to the American government. It was emphasized that the alleged blacklist recently published has never been formally brought before the American government and delegates to the conference expressed the belief that the publishing of the so-called blacklist constituted a 'trial balloon'. It was the opinion of the conferees that if any effort were made by any European power to attempt to dictate to American shipping lines against their carrying American goods to 'blacklisted' firms in neutral ports, a strong position may have to be taken."

ASKS INVESTIGATION OF MANGANESE SPECIFICATIONS

Senator Murray, Montana, last week asked Mr. Roosevelt to investigate specifications which the senator said is preventing manganese producers in Montana and other states from selling manganese to the government under the strategic minerals bill.

The senator stated the arbitrary specifications which were made public by the procurement division of the treasury department exclude sales of Montana manganese from government purchases and added that federal purchasing agents are likely "to have a hell of a lot of trouble purchasing manganese elsewhere."

Senator Murray said also that he had discussed with the President copper prices in which the Chief Executive has shown so much interest recently. The senator told the President Montana copper prices should not be subjected to regulation as long as they are confined to a fair range on which producers can operate at a reasonable profit.

CANADA TIGHTENS CONTROL OF METALS EXPORTS

Canadian order effective at once requires export permits issued by or on behalf of the Canadian minister of national revenue for the exportation of bauxite, alumina, and aluminum; cadmium; cobalt, in ore; copper in ore, concentrates, and refined; ferromanganese, ferrosilicon; lead in ore, concentrates, and refined; nickel, in ore, matte, and refined; nickel oxide; zinc in ore, concentrates, and refined; and scrap metals.

Declared purpose is to provide for control of exportation from Canada of articles capable of being converted into or made use of in the production of arms, ammunition, implements, or munitions of war, or military, naval, or air stores, in order to safeguard domestic and military requirements of such articles, and to prevent their reaching enemy destinations.

TNEC HEARINGS ON STEEL INDUSTRY MAY START OCT. 16

Justice department officials who will present the steel case to TNEC are still hoping Oct. 16 will be the date on which the hearings begin. No detailed information is yet available.

Summaries and conclusions have been made up by the department experts dealing with the information they have collected from the steel industry.

It was originally intended that when these summaries were completed they would be forwarded to the steel men who are to appear at the hearing. However, that course of procedure underwent a change and last week steel representatives were in Washington conferring with the justice department experts. Others are expected to be here this week. The names of those conferring have not been made public.

PLAN MONTHLY CANVASS OF STRATEGIC MINERALS

Monthly canvass on production, consumption and stocks of strategic minerals will be undertaken by the bureau of mines.

Action was prompted by the need for current accurate data on certain domestic and imported raw materials to assist government agencies as well as industry in meeting the various problems presented by the interruption to shipping, resulting from the European war. Dr. John W. Finch, director of the bureau, states manufacturers have on hand fairly large stocks of strategic minerals and that no immediate shortages are anticipated. Nevertheless, the fact-finding program was deemed imperative at this time because the situation requires careful watching in view of the fact that acute shortages of mineral raw materials would be detrimental to the national defense and the public welfare.

He also pointed out current data on industrial mineral raw materials would be invaluable to private enterprise and urged the patriotic cooperation of business in this effort of the bureau of mines to render a timely and essential service.

RECIPROCAL TRADE PACT WITH CHILE PLANNED

State department has announced it intends to negotiate a reciprocal trade agreement with Chile. Nov. 11 will be the closing date for the submission of briefs and also for hearing applications. Public hearings will be Nov. 27.

Included in the list of products on which the United States will consider granting concessions to Chile is iron ore, including manganiferous iron ore which is on the free list. Under the trade agreement act no commodity can be changed that is on the free list other than to freeze the commodity on the free list. Copper ore is another article which the department will consider, but this is also on the free list, subject, however, to an import tax of 4 cents a pound of copper content. Copper-bearing ores and concentrates are dutiable at 4 cents a pound on the copper contained and these also will be considered when the trade agreement is considered.

Propeller Fan Makers Form New Trade Group

■ Growing importance of propeller fans in the ventilating field resulted recently in organization of the Propeller Fan Manufacturers' association. Under sponsorship of National Association of Fan Manufacturers, 15 charter members met last January in Pittsburgh to discuss formation of the new group. At subsequent meetings in Detroit by-laws were adopted and officers elected.

Named for one-year term: President, M. W. Bauer, Aerovent Fan Co., Piqua, O.; vice president, A. R. Stephan, DeBothezat Ventilating Equipment Co., New York; secretary-treasurer, V. C. Shetler, 2-255 General Motors building, Detroit.

Association has adopted the standard centrifugal and axial fan test code of American Society of Heating and Ventilating Engineers, and members will certify the performance of their product with a copyrighted rating label.

AVIATION

INTERNATIONAL AIR TRAFFIC BOOMING; EQUIPMENT NEEDED

■ WAR in Europe is proving a boon to international airlines operated by neutrals. With world shipping and communication services seriously impaired, this nation's giant Pan American Airways is swamped with passenger, mail and express traffic on its transoceanic and South American routes.

Announcing present transport equipment must be augmented, Pan American last week ordered 6 additional 74-passenger Boeing "Clipper" ships and 13 Douglas 21-passenger DC-3s costing in all some $6,000,000. Line will finance the purchase with new stock for which rights will be issued to shareholders. According to C. V. Whitney, company's chairman, Douglas deliveries are scheduled for next spring, while the Boeing planes will not be available for at least 14 months.

"Conditions today are more favorable to firm establishment of an all-American air service than at any time since Pan American undertook ten years ago to meet the competitive advance of subsidized European airlines in Central and South America," Mr. Whitney points out.

During September his firm's South American business was about 75 per cent ahead of the same month last year. Central American traffic was up 125 per cent. Through planes on all its main routes now are booked many weeks in advance.

Whether aircraft exports are to retain their recent importance hinges largely on outcome of congressional debate over the neutrality act, in its present form cutting off shipments to our best aeronautical customers, Britain and France. In the first half of this year, prior to the embargo, planes, engines and parts advanced from eleventh to fifth place among leading American exports, amounting to $48,869,000, nearly 32 per cent above the like period last year.

Working on Allies' Orders

Although actual shipment is banned, planemakers are continuing production on their French and British military orders, storing the ships in accordance with clauses in their contracts anticipating an embargo. At the same time substantial orders are coming in from other foreign sources. Recent bookings: Douglas Aircraft Co. Inc., Santa Monica, Calif., from Japan, a 42-passenger DC-4; Royal Dutch Airlines ("KLM"), four 16-passenger DC-5s; and Scadta Airline of Colombia, two DC-5s; Lockheed Aircraft Corp., Burbank, Calif., from National Airline of Venezuela, two 11-passenger L-14s; and Kinner Motors Inc., Los Angeles, from Fleet Aircraft of Canada Ltd., 50 engines.

Should neutrality act revision result in foreign aircraft orders of such proportions as to jeopardize America's own air expansion program, the war department would not hesitate to intervene, it was indicated last week. While the department is studying the effect on production capacities of the large British and French orders anticipated upon lifting of the arms embargo, spokesmen assert it sees "nothing but benefit to both the industry and its own interests from such buying." It is felt foreign orders must attain extraordinary volume before the government would consider its procurement position endangered.

Lockheed is now test-flying its new 14-passenger bimotored "Lodestar" transport, designed to meet needs of airlines operating in North and South America. Despite its present record output of military craft, states Carl B. Squier, sales manager, the company is not curtailing commercial production.

Large-scale factory conversion is being undertaken by Stearman division of Boeing Airplane Co., Wichita, Kans. Lately awarded an air corps contract for primary training planes costing $2,843,405, Stearman will install new machinery and equipment during the next 90 days, rearranging its assembly methods to provide straightline production.

Taking bids until Nov. 1, DuBois-Martin Aircraft Corp. will build at DuBois, Pa., a one-story airplane plant costing approximately $250,000 with equipment. R. H. Martin, DuBois, is representative.

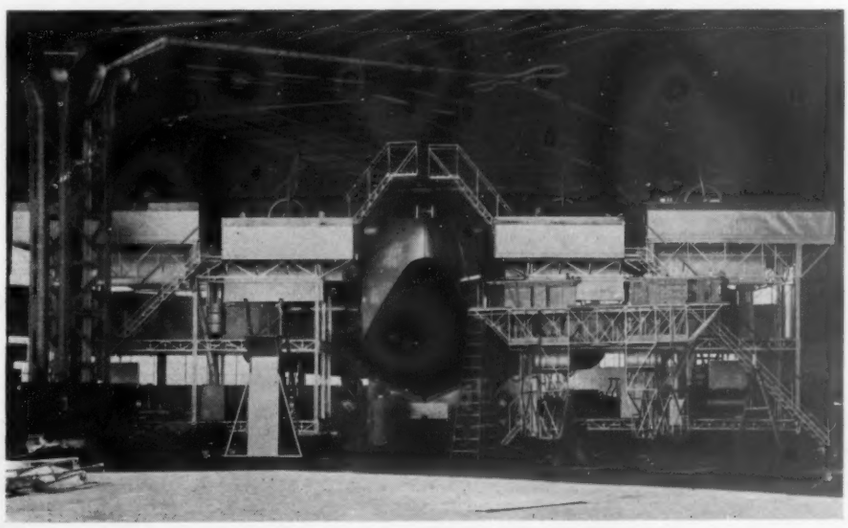
Plant Expansions Launched

General contract has been awarded by Curtiss Aeroplane division of Curtiss-Wright Corp., Buffalo, for an assembly plant addition costing nearly $100,000. Engineer is Albert Kahn Inc., Detroit. Julien P. Friez & Sons, Baltimore, maker of aeronautical instruments, has let contracts for constructing two factory extensions totaling $60,000.

Negotiations recently were concluded by Fairchild Engine & Airplane Corp., New York, Haskelite Mfg. Corp., Chicago, and flier Howard Hughes, for collaborating in manufacture of low-priced planes employing molded parts of "Duramold" plastic. Under test for nearly two years has been a 5-passenger cabin plane with fuselage of "Duramold," a special product of wood fiber and synthetic resins fused under heat and pressure.

An airplane carburetor has been designed with a diaphragm of neoprene chloroprene rubber to regulate the flow of gasoline, it is reported by E. I. du Pont de Nemours & Co., Wilmington, Del. Able to withstand continuous exposure to aviation gasolines, this diaphragm is said to make possible carburetor operation in any position, overcoming the problem of fuel splashing in carburetors during violent air maneuvers.

Servicing Giant Airliner from Steel Work Stand



■ **Bustling hangars reflect transoceanic airlines' soaring traffic figures. Illustrated is a 74-passenger Boeing "Clipper" servicing at Pan American Airways' Baltimore base. Before its four engines are portable work stands of structural steel members**

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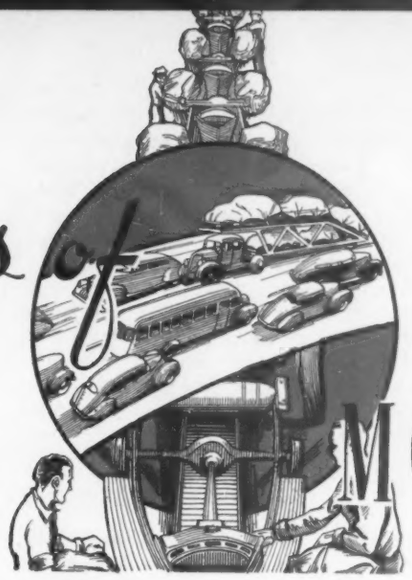

By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ MOTORDOM is packing its bags for the annual trek to the New York auto show next week. There they hope to catch definite proof of a rousing retail market for new cars which has been scented locally over the past few weeks. All plants, with two exceptions, are rolling new models for assembly lines in good volume, and by the time the show opens dealers throughout the country in all lines should have fair stocks.

Surprises at the New York show will be few, since details of practically all cars have been made public, or will have by Oct. 15. In a sense the show will be anticlimatic, but at least will provide a measure of public interest. One surprise which seems assured at this point, however, will be the appearance of Hupp and Graham Skylark models, built in the latter's plant here.

It will be recalled Hupp acquired the Skylark designs last year, being a revision of a body style pioneered by the former Cord car. Difficulties beset the Hupp organization and the Skylark was never put into volume production as planned. Now it appears a manufacturing agreement has been arranged between Hupp and Graham under the terms of which Graham will assemble Skylark models which will be sold under both Hupp and Graham names. Graham will continue to build its supercharger models for 1940.

Graham and Hupp both have had a rough time financially in recent years and this new combination, which will give their dealers the opportunity to handle two lines of cars, covering a more complete range of price classes, should improve their profit possibilities for 1940. Both companies have received RFC loans to sustain operations and it is understood arrangements have now been concluded by Graham for additional outside capital to settle some outstanding debts and provide funds for continuing manufacture.

Skylark bodies so far have been built by Hayes Body Corp. for Hupp and it is reported this interest will supply the first bodies for the new Graham-Hupp combine. Later, it is likely Graham will buy stampings and other parts on the outside, assembling and finishing bodies in its own plant. With the type of construction used in the Skylark, body and chassis are integral, so probably all manufacturing will be concentrated in the Graham plant.

Price of the Graham Skylark will be around $860, and slightly higher than the price of the Hupp model. This figure is well under the level proposed for the original Hupp Skylark.

Graham owns a plant at Wayne, Mich., which it is now trying to dispose of to provide more working capital. An option is held on the plant by a small aircraft manufacturing company but has not been exercised as yet. Prospects of greatly expanded aircraft production point to deal's favorable consummation.

■ FOREIGN business in machine tools and equipment, based on wartime needs in belligerent countries, is mounting rapidly. A machine tool company in the East, with offices here, reports the volume of orders from England in the past six weeks has climbed far beyond anything even imagined when hostilities were impending. So extensive are these orders—and they are orders, not merely inquiries—that it appears

■ One of the largest single steel stampings shown on 1940 models is this Hudson hoodgear which includes hood top, hood sides and catwalks in one unit hinged low at the front. It is locked in place by a lever on the dash and makes the motor compartment readily accessible

Britain definitely is entrenching for a long war, scotching reports of an early cessation of fighting.

Nevertheless, rumors are thick here about the European situation, many of them emanating from creditable sources. The "dummy" war on the western front has led some analysts to the conclusion a deal will be arranged between England, France, Germany and Italy, involving the retirement of Hitler, partial restoration of Poland and Czechoslovakia, ceding of French colonies in Africa to Italy.

This would lead, so they say, to an eventual alignment of the western powers—England, France, Germany and Italy—in a fight against Russia and communism. The switch of Germany from an enemy to an ally of the democracies sounds ridiculous now, but was forecast by Hitler himself years ago, and represents a belief held privately by many in this country.

Overnight boom in steel buying, with its accompanying firming of prices has had a number of interesting effects on buying practices, not the least of which is the tendency of large buyers to return to old-line material, after several years of patronizing so-called "alley" shops in this area. The latter, of course, operate strictly legitimate businesses, but naturally have low overhead and have been able to economize on material costs.

Cost Advantage Fades

For example, a small stamping plant, operating three or four rebuilt presses in a small building on the outskirts of Detroit, might contract to supply a certain quantity of stampings, using "second" or "reclaimed waster" sheets instead of prime sheet steel. Lately, however, these low-price sheets have become scarce and the price often bid up to the point where it has even exceeded the price on prime sheets, destroying a major part of the advantage which such small shops had over large established suppliers which buy mill primes at the full market price. Hence, some buyers are returning to former sources of supply, holding out attractive business for figuring.

They find these sources busy now after several lean years in which automotive business appeared to be slipping away, and not too eagerly inclined to welcome back such business.

■ FORD'S contribution to the 1940 model parade was displayed to the press here last week and constitutes four lines of cars—Ford V-8 and deluxe V-8, Mercury and Lincoln Zephyr. Most changes appeared to have been made in the Zephyr, with horsepower raised from 110 to 120, new bodies having wider and deeper windows, as well as windshield with 22 per cent more glass area, unbroken by a center dividing strip. Hood is lower, extending further forward.

Low, catwalk grille pioneered by Zephyr two years ago has a slightly altered design and the center section of the front bumper is of open construction to permit entrance of more air to the grille. Two new body types have been added, club coupe and continental cabriolet. The latter has a hood which is 7 inches longer and 3 inches lower than on other Zephyr models.

Mercury and deluxe V-8 are equipped with the new type of suspension mentioned here last week, a combination of longer and softer springs, torsion-bar stabilizer and self-sealing shock absorbers. Gearshift on steering column is standard equipment on all Ford lines. The V-8, formerly known as the standard model, may be obtained with either 60 or 85-horsepower motors, the deluxe V-8 having the 85-horsepower engine. Front and rear springs of deluxe models are equipped with metal spring covers. Sealed-beam headlamps are standard on all.

Pontiac will show 17 body styles on four separate chassis—special six, deluxe six, deluxe eight and Torpedo eight. Wheelbase on the special six has been increased 2 inches to 117 inches; overall length is increased 8¾ inches. Floors are 4 inches lower, windshields are wider and deeper, with 11 per cent more area. Front seats are 4 inches wider; rear seats are 3 inches further forward from the rear axle in the interests of a softer ride.

The Torpedo eight is the most distinctive car in the Pontiac line, carrying the new body design used on the Buick 50 and 70 series, as well as one Olds model and one Cadillac and La Salle model. Pontiac has added dual carburetion to this job, boosting horsepower to 103 as compared with 100 for the regular eight. Body mounting comprising vulcanized rubber and cotton shims placed between the body and frame is used as in the past, and in addition is placed between the frame and nuts on hold-down bolts.

Camshaft sprockets on the 6-cylinder engine are now cyanide hardened to improve wearing qualities, especially at high speeds. A copper ribbon filter has been placed in the crankcase ventilator outlet pipe to trap grit-laden dust. Gasoline filter made of a stack of thin perforated brass rings has been placed in the fuel pump, replacing the former screen. Chilled iron engine tappets have their contact surfaces granodized for longer life.

Adopt Turn Indicator

Cadillac-La Salle will have seven series of cars for 1940, five Cadillacs and two La Salles, as it launches its thirty-eighth year of car production. One Cadillac, the 62, and the La Salle special, have the new Fisher body mentioned previously. The popular Cadillac 60 special for 1939 is the forerunner of this type of body and also of the entire Cadillac line for 1940. La Salle models retain their characteristic narrow three-section die cast grille.

New on all Cadillac models is a turn indicator, manipulated by a lever under the steering wheel, which actuates flasher mechanisms controlling front and rear parking lights. A new clutch driven disk, of special spring steel, blanked and waved so that the effect is to cushion the action or engagement, is another feature of the Cadillac. This is similar to the crown spring clutch element introduced by Buick last year. La Salle models use the segmented type of clutch member adopted by Chevrolet and Pontiac.

Commenting upon the possibility of television eventually being incorporated in car radios, W. A. Houser, general parts and service manager of Cadillac-La Salle, mentions four major barriers to such a development: (1) Danger involved in diverting driver's vision; (2) excessive size of television equipment; (3) inadequate range of receivers; and (4) interference from ignition system.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	226,952	356,950
Feb.	383,900	202,597	317,517
March	519,022	238,447	389,489
April	553,231	237,929	354,263
May	540,377	210,174	313,214
June	521,153	189,402	324,235
July	456,909	150,450	218,478
Aug.	405,072	96,946	103,343
8 mos.	3,778,850	1,552,897	2,377,489
Sept.	175,630	89,623	*192,000
Oct.	337,979	215,286	.....
Nov.	376,629	390,405	.....
Dec.	347,349	406,960	.....
Year	5,016,437	2,655,171	.....

*Estimated.

Estimated by *Ward's Reports*

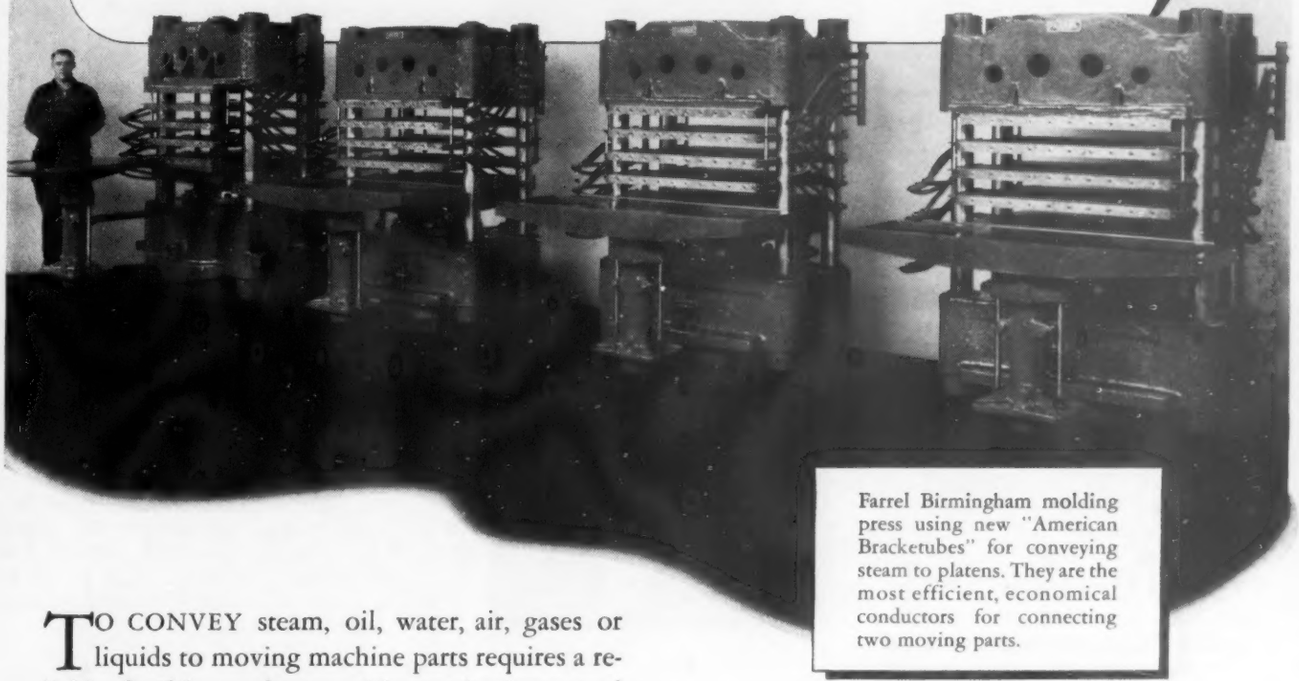
Week ended:	1939	1938†
Sept. 9	26,865	17,485
Sept. 16	41,245	16,100
Sept. 23	53,950	20,390
Sept. 30	62,755	25,405
Oct. 7	76,095	37,665

†Comparable week.

	Week Ended Oct. 7	Sept. 30
General Motors	24,925	17,550
Chrysler	24,925	21,975
Ford	13,610	9,240
All others	12,635	13,990

Flexible Connectors
for Service on Heavy Machinery

Look over your maintenance costs for leaky joints or inferior hose connections . . . then consider these facts about American Seamless



Farrel Birmingham molding press using new "American Bracketubes" for conveying steam to platens. They are the most efficient, economical conductors for connecting two moving parts.

TO CONVEY steam, oil, water, air, gases or liquids to moving machine parts requires a reliable flexible conductor with certain time-tested qualities. To avoid production shutdowns and delays, you can't take a chance on second rate articles. So, why not consider these exclusive advantages and properties of American Seamless Flexible Metal Tubing:

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In Canada: Anaconda American Brass Ltd., New Toronto, Ontario • Subsidiary of Anaconda Copper Mining Company

MEN OF INDUSTRY

■ RALPH E. HOUGH, assistant general manager, Cambria plant, Bethlehem Steel Co., Johnstown, Pa., has been promoted to general manager. He succeeds the late C. R. Ellicott. H. M. Crossett, associated with Bethlehem 21 years, and since 1931 in charge of the coke plant and blast furnaces, succeeds Mr. Hough as assistant general manager. Steelmaking experience of Mr. Hough dates back to 1905 when he joined the Lackawanna Steel Co., later acquired by Bethlehem. In 1923 Mr. Hough was made superintendent of the bar mills at Lackawanna and five years later was transferred to the Cambria plant as superintendent of the Gautier mill, the position from which he was promoted to assistant general manager in 1936.

♦

Neill Hutchings, assistant comptroller in charge of accounting, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been named comptroller.

♦

Charles F. Colbert Jr. has been elected president, director and member of the executive committee, Pittsburgh Metallurgical Co., Niagara Falls, N. Y. Mr. Colbert was formerly executive vice president, with headquarters in Pittsburgh, but will now be located in the general offices at Niagara Falls.

♦

George W. Phister has been elected secretary and treasurer, Eureka Vacuum Cleaner Co., Detroit. Clark Bennet has been named controller. Edward P. Wells was appointed vice president and general sales manager.

♦

Wallace R. Campbell, president Ford Motor Co. of Canada, has been appointed chairman, Canadian war munitions and supply board. He will co-ordinate all wartime manufactures.

♦

J. G. Graham and C. H. Reymer have been appointed manager of railway sales and railway sales engineer, respectively, Oliver Iron & Steel Corp., Pittsburgh.

♦

William E. Fertel, for many years associated with Fertel-Dangler, Wilson & Co., Cleveland, and the David J. Joseph Co., Cincinnati, is now identified with the Philip W. Frieder Co., Cleveland.

♦

Armco Railroad Sales Co., Middletown, O., has appointed the following district sales office managers: H. M. Arrick, St. Louis; R. Y. Barham, and Eugene Harbeck, Chicago; G. R. Betts, Minneapolis; W. N. Crout, Cleveland; R. B. Fraries, Philadelphia; W. J. Kelley, Denver; W. P. Lipscomb, Richmond, Va.; N. A. Powell, Houston, Tex.; W. B. Quail and W. A. Dibblee, New York.

Ralph E. Hough

Charles F. Colbert Jr.

David Findlay

Who, as noted in STEEL, Oct. 2, page 24, was elected president, L. S. Starrett Co., Athol, Mass. Mr. Findlay formerly was first vice president and general sales manager

♦

Gerald Hulett has been re-appointed general sales manager, Electromaster Inc., electric stove manufacturer, Detroit, after having been Bendix Home appliances western sales manager at San Francisco for two years.

♦

Lawrence E. Joseph has been elected a director and vice president, Blaw-Knox Co., Pittsburgh. Mr. Joseph recently was appointed executive head of the Blaw-Knox division.

♦

Eugene E. Griest, formerly vice president and general manager, Fort Pitt Malleable Iron Co., Pittsburgh, has been made vice president and general manager, Lehigh Foundries Inc., Easton, Pa.

♦

Vernon E. LaCour, who recently became associated with Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been named farm products agent for Louisiana, with headquarters in Baton Rouge.

♦

Frank A. Young, long associated with Allis-Chalmers Mfg. Co. at Milwaukee, has been transferred to the Pittsburgh district office where his activities will largely be identified with the crushing, cement and other related industries in which he has had a broad service and sales experience.

♦

Oliver C. Spurling, for 30 years in charge of the design and construction of Western Electric Co. factories here and abroad, retired Sept. 30, at the end of a 46-year career. He is succeeded by Henry L. Ward, assistant to Mr. Spurling since 1935.

♦

Edward H. Platz Jr., since 1920 associated with sales of stainless and corrosion resistant alloy steels, has resigned from Faitoute Iron & Steel Co., Newark, N. J., to join the alloy steel sales department of Lebanon Steel Foundry, Lebanon, Pa.

♦

F. A. Faron and E. G. Dudley have been named assistant managers, New York district industrial department, General Electric Co., Schenectady, N. Y. Mr. Faron was formerly New Haven, Conn., office manager; Mr. Dudley has been with the New York district industrial department.

♦

Col. Harlow D. Savage, vice presi-

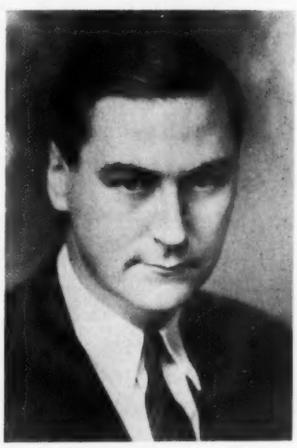
dent, Baker & Spencer Inc., New York engineering firm, has been elected executive vice president, Universal Plastics Corp., New Brunswick, N. J.

♦

William H. Childs, a pioneer in the fence and wire industry, has retired as sales manager, wire division, Continental Steel Corp., Kokomo, Ind., to devote his time to personal interests, including his hobby of photography. At the age of 18, Mr. Childs joined the former Page Fence Co., and in the 40 years since has held various executive positions, culminating with his appointment by Continental in 1930.

N. L. Hite, since 1927, assistant sales manager, wire division, has been named sales manager, to succeed Mr. Childs. Mr. Hite has been with the organization 33 years, starting with the Kokomo Steel & Wire Co. in 1906, which later became a part of Continental. Frank L. Hornbrook, assistant sales manager, manufacturers' wire division since 1929, has been made assistant sales manager, wire division.

N. L. Hite



Frank L. Hornbrook

♦

Arthur G. Greenamyer, the past 12 years district manager at Buffalo for Republic Steel Corp., previous to which he served as assistant district manager for eight years, has retired. Henry F. Marquardt, at present assistant district manager, will be in charge of Buffalo operations until a successor to Mr. Greenamyer is named.

William H. Childs

♦

L. A. Ver Bryck has been named assistant manager, welded fabric and construction products division, Pittsburgh Steel Co., Pittsburgh. He has been associated with the sales department of that division since 1928, with the exception of a period of about a year with the Wheeling Corrugating Co. Robert L. Glose continues as manager.

♦

Marion G. Crosthwait has been appointed assistant superintendent, Fairfield wire works, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Mr. Crosthwait's career with the United States Steel Corp. began in 1920 when he was employed as a draftsman in the Fairfield plant of American Steel & Wire Co.

♦

Gano Dunn, president, J. G. White Engineering Corp., New York, has been chosen as the 1939 recipient of the Hoover medal, "awarded by engineers to a fellow engineer for distinguished public service." The medal will be presented to Mr. Dunn by the American Institute of Electrical Engineers at its annual convention in New York, Jan. 22-26, 1940.

♦

John Dolza, formerly assistant chief engineer, Buick Motor division, General Motors Corp., Flint, Mich., has been appointed special project engineer, assigned to advance development problems. Edward T. Ragsdale, the past several years Buick body engineer, has been promoted to assistant chief engineer, retaining, however, direct supervision over all body and sheet metal engineering activities. Verner P. Mathews, engineer in the chassis division the past 12 years, becomes chassis engineer in charge of all chassis engineering activities. James H. Booth, since 1935 specializing in steering, suspensions and other phases having to do with ride and handling, becomes chassis division engineer. Edward F. Reynolds, formerly assistant body engineer, is now body division engineer.

DIED:

■ JOHN E. KREPS, 75, for many years an officer of the former Union Rolling Mill Co., Cleveland, in that city, Sept. 29. He was vice president, treasurer and purchasing agent while the works was still a puddling mill and in 1920 when the Union company merged with Upson Nut Co., Mr. Kreps was vice president, which position he held until 1930 when the Bourne-Fuller properties were taken over by Republic Steel Corp.

♦

Harry Lindberg, 58, sales engineer, Motor Products Corp., Detroit, in Detroit, Sept. 30. At one time he was production manager, Cadillac Motor Car division of General Motors Corp., and later was plant manager, Fisher Body division in St. Louis.

♦

Donald MacMurray, 48, retired executive vice president, Acme Steel Co., Chicago, in that city, recently.

♦

Edward C. Merritt, 78, retired vice president, Solvay Sales Corp., New York, at his home in Garden City, L. I., Oct. 1.

♦

Morris J. Greenlees, 51, engineer in the diesel engine division of General Motors Corp., Detroit, in that city, Sept. 24. He formerly was purchasing agent, Hupp Motor Car Co., Detroit.

♦

Robert Bowne Minturn Cook, 74, eastern sales manager, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., in New York, Sept. 27. He had been with Russell, Burdsall & Ward 51 years, starting with the company as an office boy.

♦

William T. Filmer, 63, supervisor of safety, Youngstown Sheet & Tube Co., Youngstown, O., Oct. 1 in that city. He was one of the Youngstown district's leaders in safety and fire prevention, heading the development of that program at Sheet & Tube's works since 1912.

Editorial

Industry's Attitude Toward War

■ MOST industrial leaders favor a neutrality policy of the cash-and-carry type recommended by the administration. They believe it would provide maximum insurance against untoward incidents which would be sure to inflame war psychology in this country.

Contrary to widely prevailing opinion, however, industrial leaders are far from enthusiastic about that feature of the plan which would legalize the manufacture of finished war munitions for export to belligerent powers. There has been no favorable response on the part of industrial leaders to President Roosevelt's question: "From a purely material point of view, what is the advantage to us in sending all manner of articles across the ocean for final processing when we could give employment to thousands by doing it here?"

Business Leaders Declare Wartime Profits Are Purely Fictitious

Industry's dislike of war and of war business is based soundly on businesslike considerations. It has found that war munitions business encourages over expansion and induces loose management policies of the "blue sky" type. It has found that large-scale production of death-dealing implements sways the emotions, enhancing the possibility of our going to war. It has found that the severity of the inescapable depression after a major war is influenced vastly by the degree of intensity of our wartime mobilization. It has found that profits on wartime business are fictitious since they are absorbed by higher taxes or lost in the ensuing depression.

There is another reason why business leaders hate war, particularly at this time. This is their fear of an administration which at no time has exhibited any sympathy toward business, or any ability to understand its true significance in our national life. Business leaders think they have good reason to fear that full wartime mobilization might herald the complete extinction of free enterprise in this country.

Varied Factors Likely To Dictate Extent of Industrial Mobilization

In the event that the existing embargo against the sale of war munitions to belligerents is lifted, the extent to which we will mobilize for war will depend on a number of factors. It will be determined by the country's own defense needs. It will be influenced by the extent to which belligerent powers qualifying under the cash-and-carry plan demand help from our suppliers. It will depend on the volume of peacetime business available to us in our domestic markets and in South American and other neutral countries. It will depend on the extent to which, as revealed by the passage of time, this country's own selfish interests demand the devotion of our industry to war.

For these reasons, plus the fact that domestic business now is at a high level of activity, it is unlikely that we will have any immediate "war" boom based on munitions orders. Direct war business is likely to consist mainly of all sorts of materials and parts and the machinery required in manufacturing, further finishing and assembling these materials and parts. In other words, barring unforeseen developments, the emphasis of industry will be on business of a character that will set up the least amount of dislocation.

The BUSINESS TREND

Activity Index At Highest Level Since August, 1937

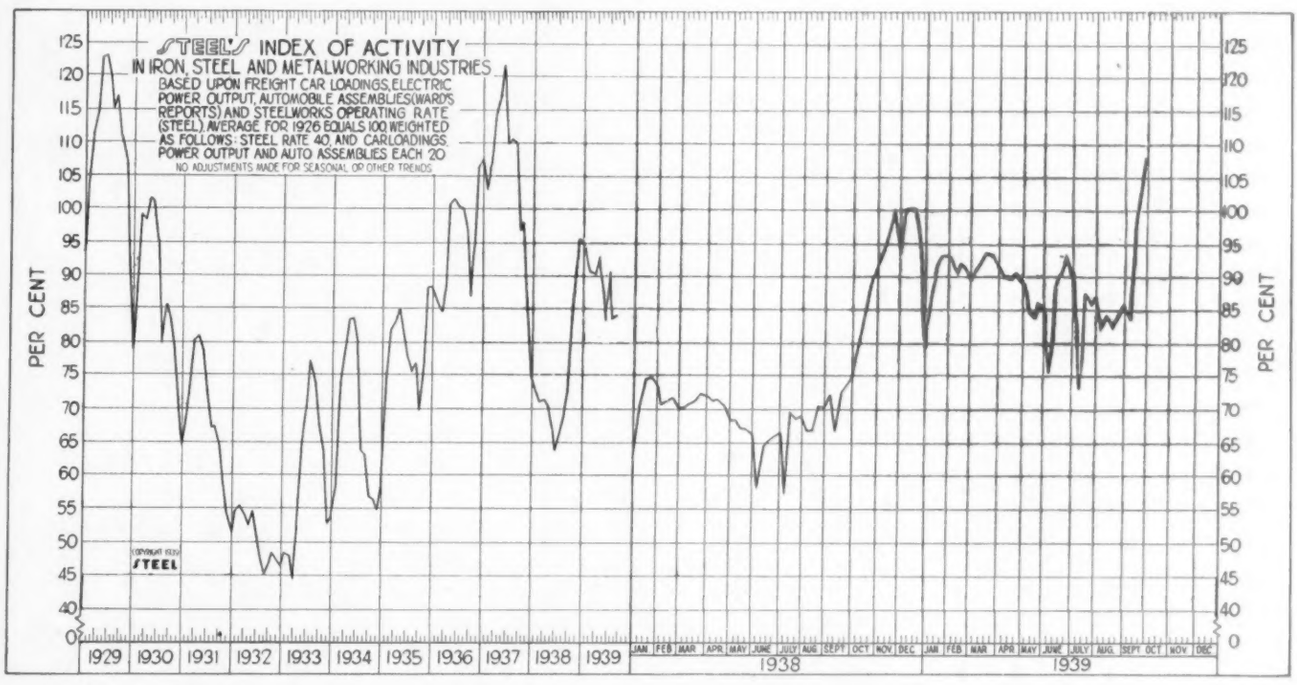
■ Reflecting the vigorous upturn in industrial activity throughout September, STEEL's index average for the month rose to 98. This represents a gain of 14.1 points from the July index figure of 83.9. The September average compares with 72.5 in the same month last year and also exceeded the September, 1937, index figure of 96.8. However, during the 1937 boomlet the monthly index touched 121.7 in May.

During the week ended Sept. 30, STEEL's weekly index gained 4.9 points to 107.9. This is the highest level reached since Aug. 28, 1937. In the comparable week last year the index stood at 74.9, and in 1937 at 96.6.

The latest gain recorded by the index reflected the continuation of the encouraging upward tendency in recent weeks of the four business indicators from which it is composed. Current indications point to further improvement in these industrial barometers, so it seems probable that during the next few weeks the index will forge ahead to still higher levels.

The substantial increase in employment reported during September is concrete evidence that industrial activity has made encouraging gains, particularly in the heavy industries. An important feature in this development has been the large scale buying by the railroads for rolling stock and extensive car repair programs. Another important development has been the announcement of a number of industrial plant expansion programs and purchase of new equipment.

Proof that large scale purchase of new equipment developed during September is given in a recent survey by the National Machine Tool Builders' association. The association points out that during the first half of



STEEL'S index of activity advanced 4.9 points to 107.9 in the week ended Sept. 30:

Week ending	1939	1938
July 15	87.8	69.9
July 22	86.0	68.7
July 29	86.8	69.0
Aug. 5	83.5	66.9
Aug. 12	83.9	66.9
Aug. 19	82.2	70.5
Aug. 26	83.4	70.3
Sept. 2	86.3	72.3
Sept. 9	83.7	66.8
Sept. 16	97.5	72.9
Sept. 23	103.0	74.0
Sept. 30	107.9	74.9

Mo. Data	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Jan.	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6	104.1
Feb.	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2	111.2
March	92.6	71.2	114.4	88.7	83.1	78.9	44.5	54.2	80.4	98.6	114.0
April	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7	122.5
May	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2	122.9
June	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8	120.3
July	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9	115.2
Aug.	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4	116.9
Sept.	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7	110.8
Oct.	....	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8	107.1
Nov.	....	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0	92.2
Dec.	....	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3	78.3

September machine tool makers received twice as much domestic business as in the full month of August. Foreign orders also recorded sharp gains.

Of the four industrial barometers composing STEEL'S index, steelmaking operations continued to record the best week-to-week gain. The national steel rate increased 4.5 points to 84 per cent, during the week ended Sept. 30, to reach the highest level since Aug. 14, 1937. Further advance in steelworks operations was recorded last week.

Automobile production, electric power output and revenue freight carloadings also registered encouraging gains during the week ended Sept. 30. The latter two touched new 1939 highs. Electric power consumption registered a new all-time peak.

FOREIGN TRADE IMPROVES DURING AUGUST

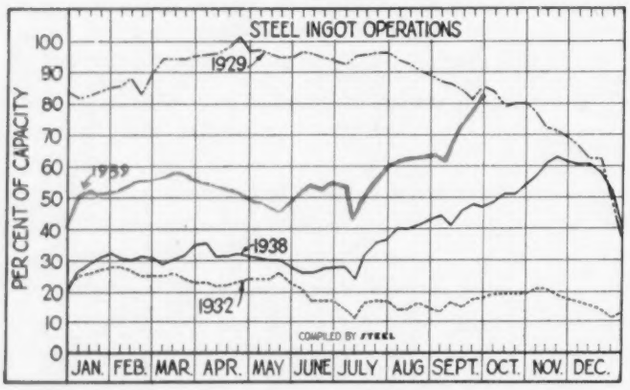
Total exports of the United States during August increased 9 per cent over the July level, while imports were 4 per cent greater. The increase in exports in the last month before the start of the European war was much sharper than the average increase during August of the preceding five years, while the gain in imports compares with decreases in August in four of the five years. Exports during August totaled $250,839,000, the largest since last March and compared with $229,629,000 in July and $230,790,000 in August, 1938. Imports totaled $175,756,000 in August, against $168,925,000 in July and $165,516,000 in the comparable month last year. The export balance of trade during August of $75,083,000 compares with $60,704,000 in July and $65,275,000 in August, 1938. For the first eight months this year the excess of exports aggregated $457,136,000, against $781,832,000 in the comparable 1938 period.

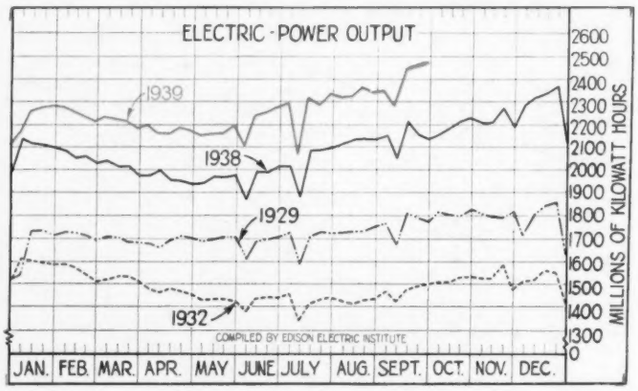
Reflecting a decline in shipments of iron and steel scrap during August, the total exports of iron and steel products in that month receded to 477,078 tons from the 513,664 tons shipped during July. Excluding scrap, exports of iron and steel products increased 13 per cent during August.

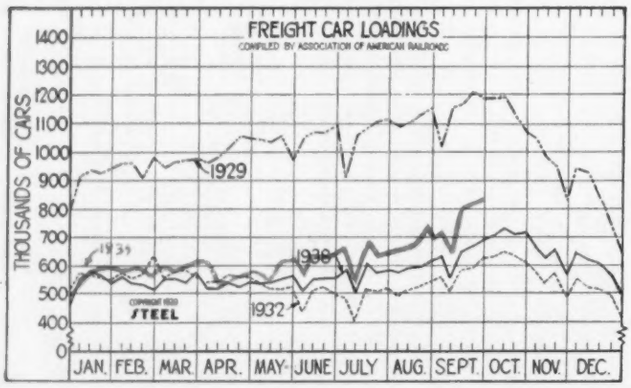
RAILROAD EARNINGS RECORD MODERATE GAIN

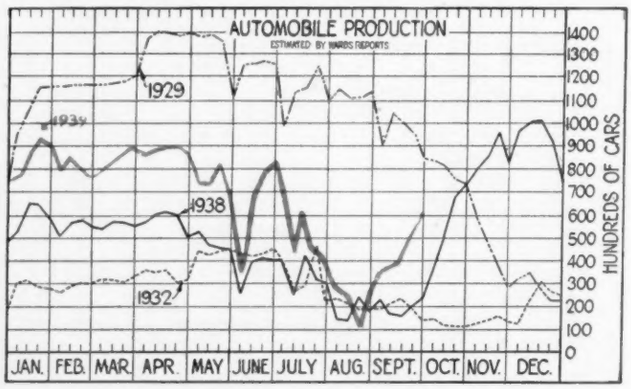
Net operating income during August for Class 1 railroads totaled $54,586,246, or 2.01 per cent return on investment, compared with $45,421,781, or 1.67 per cent return, in August last year. In July net operating income amounted to $49,011,915.

For the first eight months this year net operating income aggregated $269,349,356, or 1.72 per cent on the property investment. In the comparable period last year net operating income totaled $155,038,546, equal to 0.99 per cent return on investment.

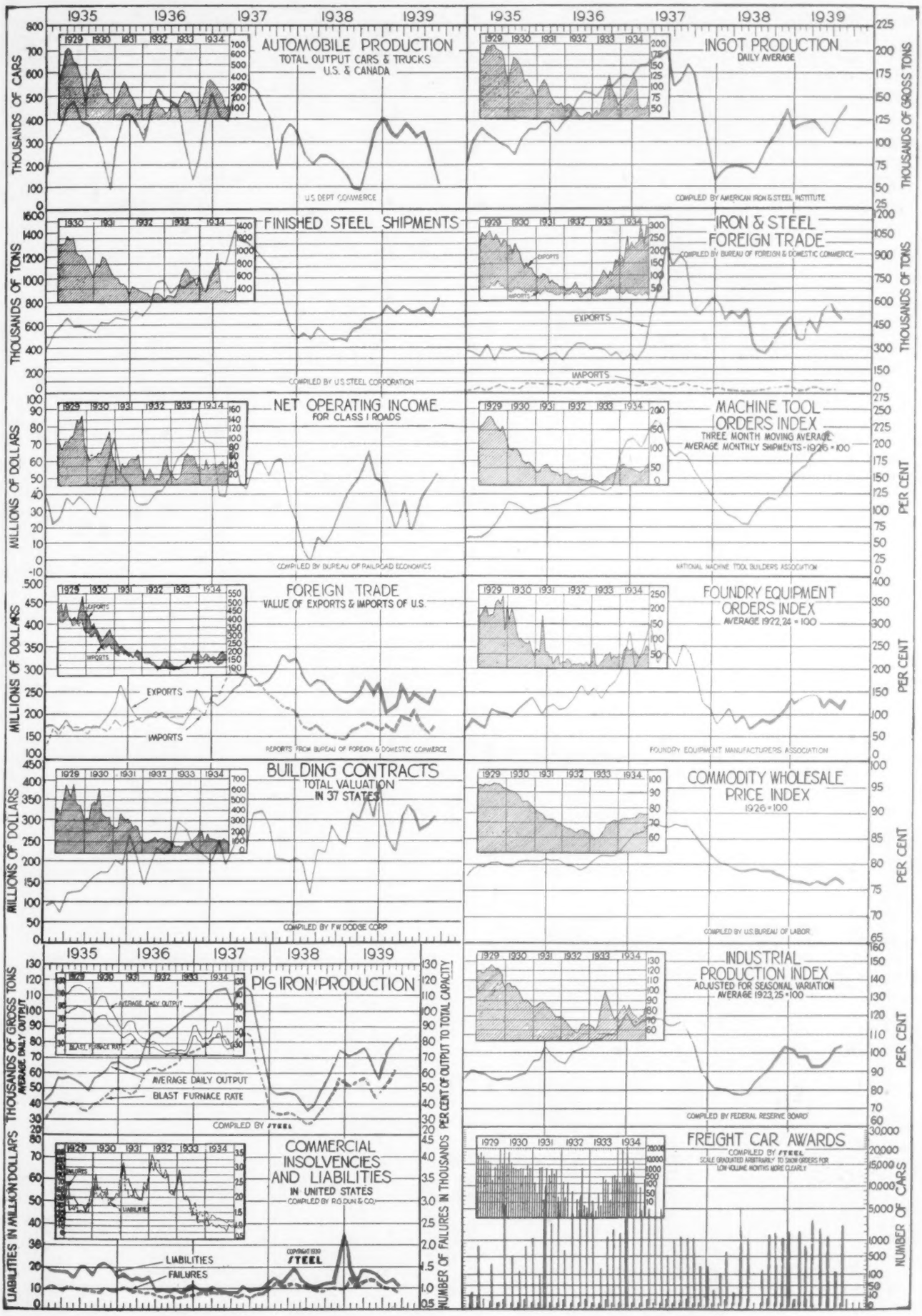








Week ending	Steelworks Operating Rate Per Cent 1939	1938	1932	1929	Electric Power Output Million KWH 1939	1938	1932	Freight Car Loadings Thousands of Cars 1929	1939	1938	1932	1929	Weekly Auto Output 1939	1938	1932	1929
June 24	54.5	28.0	17.0	94.0	2,285	2,019	1,440	1,723	643	559	499	1,096	81,070	40,918	45,110	125,736
July 1	54.0	28.0	14.5	93.0	2,300	2,015	1,456	1,592	666	559	480	909	70,663	40,945	40,291	98,746
July 8	42.0	24.0	12.0	95.0	2,078	1,881	1,341	1,712	559	501	416	1,065	42,784	25,375	26,560	113,586
July 15	50.5	32.0	15.5	95.5	2,234	2,084	1,415	1,727	674	602	504	1,079	61,610	42,010	29,870	115,075
July 22	56.5	36.0	16.5	96.0	2,295	2,085	1,433	1,723	657	581	502	1,101	47,420	32,070	46,375	123,512
July 29	60.0	37.0	16.5	96.0	2,342	2,094	1,440	1,725	660	589	511	1,104	40,595	30,390	22,461	110,163
Aug. 5	60.0	40.0	14.5	94.0	2,325	2,116	1,426	1,730	661	584	497	1,091	28,250	14,771	23,591	114,364
Aug. 12	62.0	40.0	14.5	93.0	2,333	2,134	1,415	1,733	661	589	512	1,100	24,875	13,790	21,162	111,939
Aug. 19	63.5	41.5	15.5	90.0	2,368	2,139	1,431	1,750	674	598	518	1,136	12,955	23,940	19,568	111,902
Aug. 26	63.5	43.5	14.5	89.0	2,355	2,134	1,436	1,762	689	621	538	1,160	18,365	18,700	19,896	113,316
Sept. 2	64.0	44.5	13.5	87.5	2,357	2,149	1,464	1,675	722	648	561	1,017	25,240	22,165	19,561	90,913
Sept. 9	62.0	41.5	15.5	86.0	2,290	2,048	1,423	1,806	667	569	501	1,153	26,865	17,485	21,586	104,351
Sept. 16	74.0	46.0	15.0	84.5	2,444	2,215	1,476	1,792	806	660	587	1,166	41,245	16,100	23,116	100,042
Sept. 23	79.5	48.0	17.0	82.0	2,449	2,154	1,490	1,778	815	676	596	1,202	53,950	20,390	19,327	95,453
Sept. 30	84.0	47.0	18.0	85.0	2,470	2,139	1,499	1,819	835	698	622	1,179	62,755	25,405	13.265	83,201


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACTS
TOTAL VALUATION IN 37 STATES
COMPILED BY F.W. DODGE CORP
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
THOUSANDS OF GROSS TONS
PER CENT
NUMBER OF CARS
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
PERCENT OF OUTPUT TO TOTAL CAPACITY

Station-Type Machines

Speed

■ WHILE THE so-called "station-type" or "station-to-station" machine tool has come into prominence within the last 30 years, primarily because of intensive production methods in the automobile industry, this idea of multiple stations for tools and work actually goes back much further than that.

The station-type machine tool is a natural result of the repetitive work involved in interchangeable manufacturing—work accomplished through a definite series of operations which, if handled efficiently, are repeated over and over again in the same logical sequence on every piece in a given lot.

Originally, this kind of work was accomplished, either through the use of a battery of several machines each accomplishing only one operation; or it was done on one machine through the use of several sets of tools which had to be set up and taken down for each operation. In either case there was much nonproductive time, either in passing the work from operator to operator and in waiting for it to be passed along; or in the constant mounting and demounting of the tools.

The invention of the turret did away with this loss of time due to mounting and demounting tools. It did so by providing means whereby at least all end working tools used on almost any typical lathe job could be mounted on an indexing drum, by means of which they were one by one swung into working position quickly, accurately and in proper order for most effective operation. This idea was soon extended to take care of tools on the cross slide, thereby making it possible to have all turning, facing, necking and cutting-off tools turret-mounted for instant action.

The turret idea, which gradually was extended to milling machines, drilling machines, tapping machines, broaching machines and numerous other high production tools, is the basis for practically all station-to-station designs other than those involving "feed-through" and other straight line systems of tool or work transfer from operation to operation.

In some of the station-type machines, the turret idea may be hard to recognize but it is there never-

Fig. 1 (left)—Krueger machine which combines multi-position indexing work table with special drilling and milling heads. Fig. 2 (right)—Cincinnati double-ram broaching machine eliminates nonproductive time by simplifying handling of work

Up to Repetitive Work

By GUY HUBBARD
Machine Tool Editor

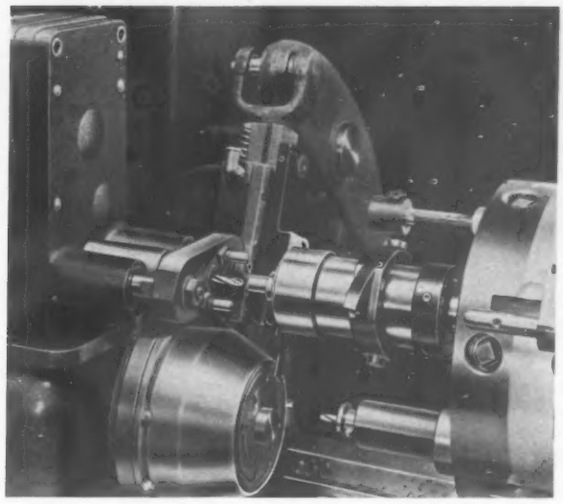


Fig. 4—By use of a second operation unit this Cleveland single spindle automatic becomes a station-type machine capable of machining parts subsequent to cutting off

theless. That is true particularly of multiple spindle chucking machines. These machines, which today are made in a wide variety of types and sizes ranging from those suitable for watch parts up to those weighing 40 tons and handling work a foot or more in diameter, have the turret idea applied both to the work and to the tools.

The basic design makes use of a drum in which the spindles—four, five, six or eight in most cases—are mounted; and another drum, multiple faced longitudinal slide or series of longitudinal slides on which the tools are carried. The drum or turret carrying the spindles indexes step by step, thus bringing every spindle opposite each one of the multiple tool positions in the course of one complete revolution of the spindle carrier. The tool turret, on the other hand, does not index, but does move back and forth in line with the spindles.

Tools Operate Simultaneously

The secret of the efficiency of a machine of this type is that all the turret tools operate simultaneously or at lease at sometime during each forward traverse of the turret. Therefore, the productive time per piece can be figured as approximately the time of the longest single operation. The word approximately is used because some small allowance must of course be made for the time involved in withdrawing the tools, indexing the spindle carrier, stock feeding, loading and unloading work (in the case of chucking machine).

Two of the illustrations used with this article serve very well to bring out not only the design but also the production possibilities of station-type machines of multiple spindle type. Let us consider first the machine shown in Fig. 3. This is a Baird six-spindle chucking machine in operation in the plant of the Studebaker Corp. It is set up on a piston job. The complete cycle of operations as carried out automatically in this machine is as follows: Rough turn outside diameter; rough and finish face head; finish turn land; rough and semi-finish ring grooves and oil groove; and finish cam-turn outside diameter.

The tooling possibilities on machines such as this are almost endless. As indicated by this illustration, various auxiliary tools can be applied, such as that set which is mounted on the overarm and actuated from the cam drum on the end of the bed. Setups such as this are warranted of course only where considerable quantities are involved. That is indicated by the fact that the estimated production with this setup is 240 pistons per hour.

The other machine which illustrates the idea of the indexing work holding element is that shown in Fig. 1, which also is in the Studebaker piston production line. This Krueger machine is of vertical type, with the work held in special fixtures mounted on an indexing table. The work is done by unit heads feeding down from above. The cycle of operations is as follows: First station, load piston in fixture; second station, drill two holes for slot; third station, mill long slot; fourth station, mill small slot. Through this cycle of automatic operations and the fact that the operator has only to load

(*Please turn to Page* 69)

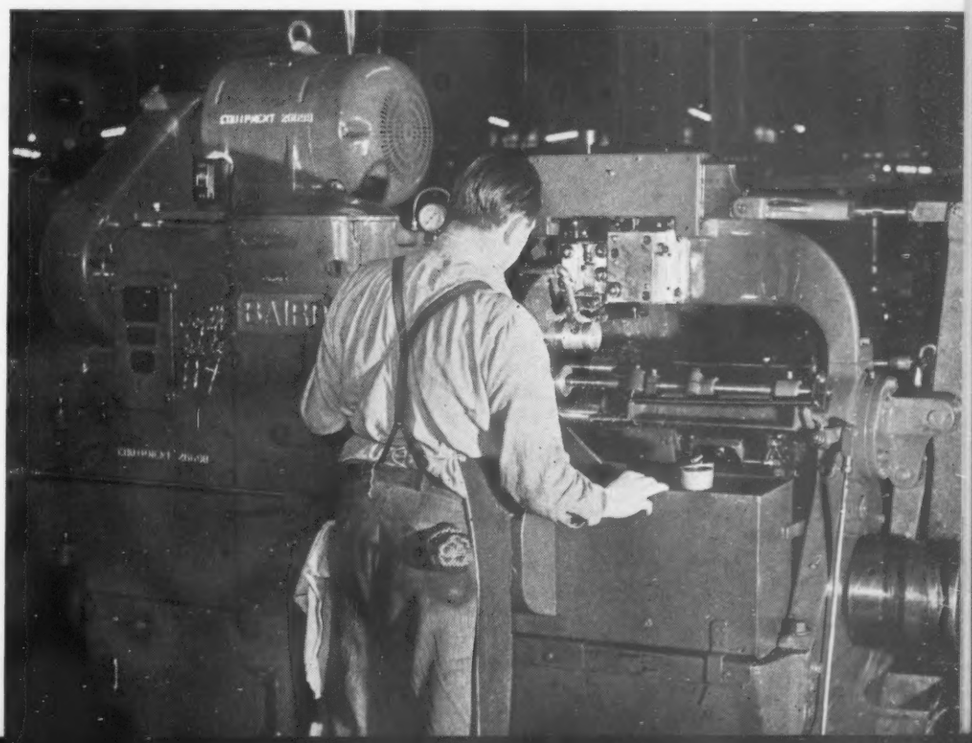


Fig. 3—Baird automatic chucking machine of multiple spindle type illustrates application of station-to-station principle to machining of Studebaker pistons

Southern

Manufacturing Pr[e]al

And Buildings in L[o]

■ CLIMAXING months of research, designing and experimental work by its engineers in collaboration with the construction division of the United States Farm Security administration, the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., is undertaking volume manufacture of prefabricated or knocked-down steel houses and farm buildings for Southern locations under the tradename U. S. S. Panelbilt to establish its practicability. To this end, the company has set up necessary production facilities in its Fairfield, Ala., fabricating shop, installing considerable new machinery and modernizing existing equipment.

Development of the prefabricated building is an interesting chapter in steel in the South, and is creating wide interest as evidenced by inquiries from many points in the United States. The idea was to develop permanent, livable and usable structures for farmers, and for industrial workers and others in the low-wage brackets, at prices they can afford to pay. The design evolved features a construction of standard dimensional building units, to offer the utmost in long life and protection against rot, termites and reaction to extreme cold or heat. Buildings for many purposes with flexible floor plans and elevations may be built with the Panelbilt units. It is anticipated that contractors' prices will be comparable with good conventional frame construction.

The company has made it clear that it will not enter the erection or retail sale of the structures. It is the intention to supply the prefabricated materials to contractors, builders or large-volume buyers.

First shipment of 14 groups of

The ramshackle farmhouse in Walker county, Ala., (upper left) is of the type which United States Farm Security administration is replacing with prefabricated steel houses manufactured by Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. In the circle is shown a house erected on a project at Tysonville, Ala. It has three bedrooms, living room and combination kitchen-dining room. At the lower right, workmen are shown erecting a knocked-down steel barn of same general construction

n Steelmaker

Prabricated Houses

in Low Cost Range

these buildings was made last November to sites selected by FSA in Alabama, Florida, Georgia and South Carolina. Each unit included five buildings—a dwelling, barn, chicken house, outdoor pantry, smokehouse, and a sanitary outdoor toilet.

The dwelling contains five rooms —living room, three bedrooms, and combination kitchen and dining room. Two large closets and a pantry are included and space is available for a bathroom if desired. Approximately 6 tons of steel are used in the dwelling. All the foundation structure, the frame, sides, roof, exterior door and window trims and fireplace are of steel. Windows are of steel casement type; doors are of steel or wood; and floors are wood. Steel joists support the floor. An insulating wallboard is used as interior finish for walls and ceilings. This also serves as insulation and is utilized in a manner designed to lend to attractiveness of the interior. Inside partitions are insulated wallboard supported on steel frames.

About 12½ tons of steel are required for the unit of five buildings. Outbuildings are entirely of steel. Complete prefabrication permits rapid erection by the simple expedient of bolting together the formed panels, and this can be done by unskilled labor when experienced labor is not available.

The barn consists of a corn crib, two compartments for animals, a compartment for implement storage and a hay loft. It is 32 feet long and 20 feet wide. The poultry house, 10 x 12 feet, has a steel mesh panel in front to provide ventilation. The outdoor pantry is 8 x 12 feet. A roof overhang of 3½ feet on one side forms a shelter that can be utilized as space for household work.

Units erected for FHA cost approximately $3100 each, including dwelling, barn, poultry house, smokehouse and privy. Prices on individual buildings ranged from $1700 to $1900 for the dwelling; $700 to $900 for the barn; about $150 for the poultry house; about $140 for the smokehouse; and about $55 for the privy. These costs will vary, however, according to the location, and charges made by contractors.

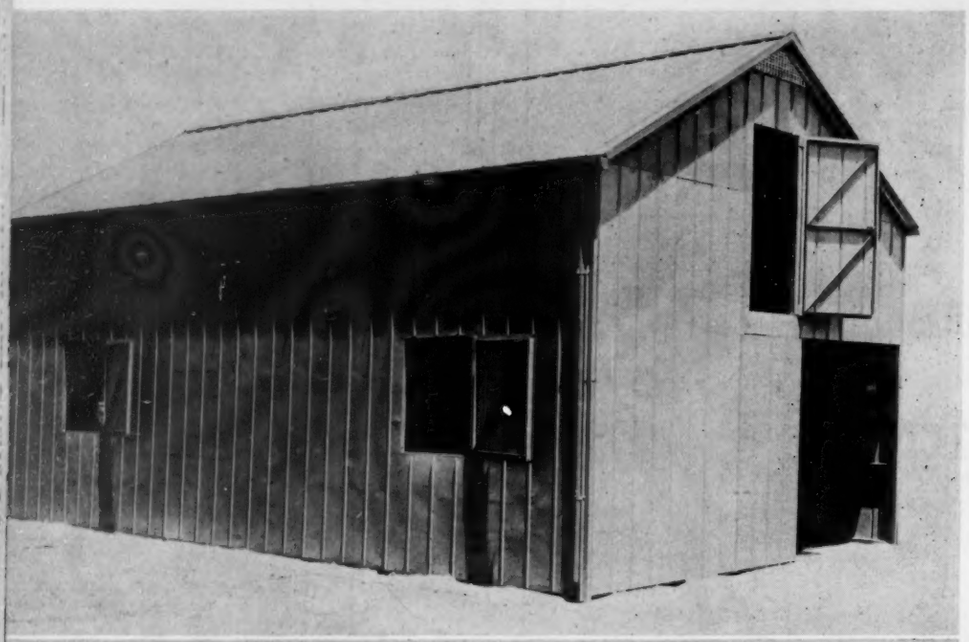
Dwellings and outbuildings are available in several attractive designs and dimensions, and a type of construction which permits units to be added. With the dimensions in multiples of 4 feet, the owner, for example, can easily add one or two rooms to the dwelling. Steel construction makes the buildings lightning proof, vermin proof and noncombustible, and overlapping sealed field connections in the siding and roofing renders them weather proof.

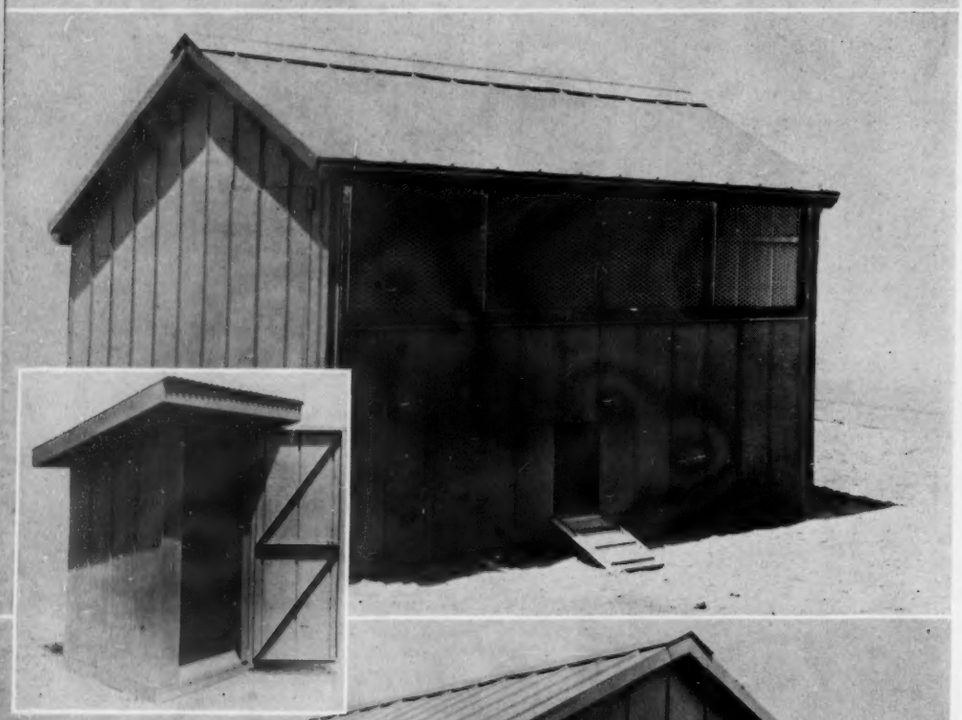
Long Term Financing

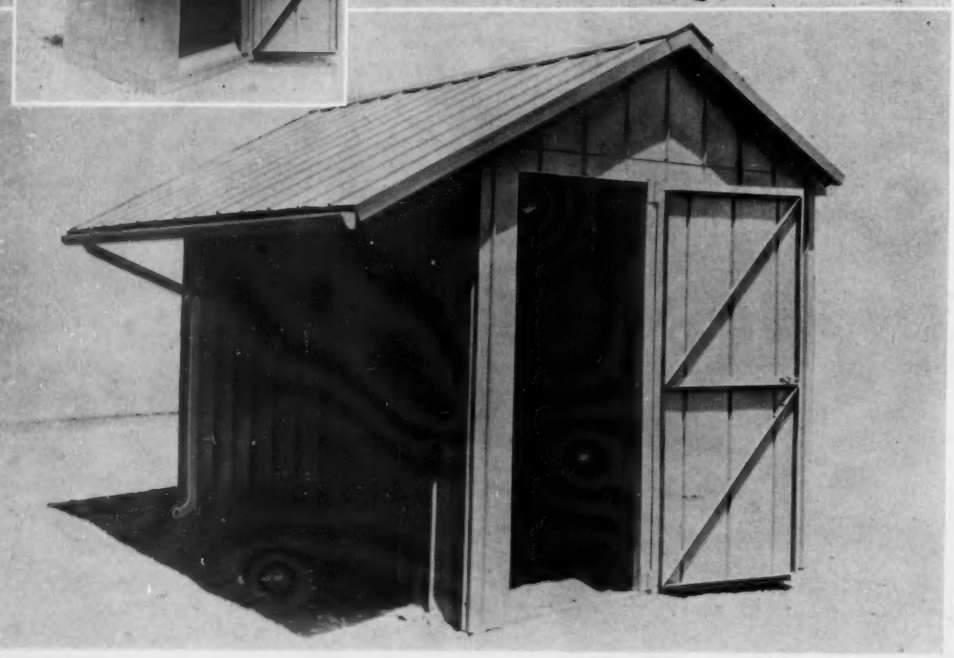
Paramount in consideration of materials and selection of steel was the fact that long-term financing, ranging up to 40 years through FSA, called for a material of durability. Through use of steel, waste is eliminated and maintenance cost is low. Panelbilt buildings are easily moved from one site to another and salvage is virtually 100 per cent.

Design standardizes on 4-foot wide panels or modules, for floors, ceilings, roofs and outside walls of all structures with such lengths as are needed, with half panels made for use when desirable. Since partitions are designed as nonbearing and the covering is attached in the field, there is no necessity to restrict inside room dimensions to any particular multiple. Partition frames are made in widths of 2 feet, 3 feet and 4 feet as individual units, with a percentage of adjustable width frames to allow for filling special spaces. This provides flexibility in arranging dimensions of rooms, closets and hallways, and permits subsequent rearrangement without affecting the exterior shell.

Frame members of panels are formed from 14-gage sheets with webs 2⅜ inches deep and flanges 1⅛ inches wide and of greater gage







if conditions require. The ends of cross members or belt courses of the frames are formed sufficiently narrower to provide a slip fit into the side member channels and are welded rigidly in place.

Roof and ceiling panels are the same as for outside walls except in length. This dimension varies with span of the roof, but by standardizing on a specific pitch it is necessary to provide individual lengths only for each 4-foot variation in width of building. This also simplifies construction of gable panels as they can be made interchangeable for all buildings. The two sides of the roof with the corresponding ceiling panel are formed into triangular Pratt truss, assembled in the field, with struts and diagonals connected by bolts. This roof system does not lend itself readily to hip and valley construction, although such can be provided at somewhat greater expense. So far no real demand for it has developed.

Shop Welding on All Parts

Contact shop welding of all parts of the frame panels and outside covering materials in precision jigs produces strong rigid units with no exposed connections to be affected by expansion and contraction and insures accurate fitting of all parts for erection. No holes are punched in the exposed surfaces to encourage leakage and deterioration.

Beaded steel sheet ceiling may be welded to the lower side of the ceiling panels and insulated above with mineral wool, either loose or in bats. There is no combustible material above the ceiling line. Sheet steel stove flues and chimneys are attached directly to the roof structure without danger of fire. If desired, fiber board or other surfacing attached directly to the ceiling frames in the field may be used in lieu of overhead sheet ceiling.

Outside wall and roof covering of all structures is standard galvanized steel sheets. They are attached to the frames in the shop by spot welding and thus become an integral part of the frame structure, adding materially to its strength and rigidity and obviating

The steel barn (top) is of standard Panelbilt construction. It is 20 feet wide, 32 feet long; has two stalls for animals, a wagon shed, feed storage room and hay loft over all. The poultry house (center) is 10 x 12 feet and has a steel mesh panel for ventilation. A sanitary outdoor privy is shown in the inset. The steel storehouse (bottom) is 8 x 12 feet, with a 3½-foot overhang shelter on the left side

WORLD'S LARGEST MURAL

. . . . enameled on YOUNGSTOWN SHEETS

Designed by J. Scott Williams (under commission from New York World's Fair), ground coated at Toledo Porcelain Products, and translated into polychrome porcelain by the artist Daniel Boza of Bomat, Inc. at the Cleveland Art School for Ferro Enamel Corporation, this beautiful contribution to both pure art and architecture comprises the best skill of many artisans. Significantly, Youngstown Sheets were chosen as the foundation for this critical piece of exhibition work at the New York World's Fair's Home Furnishings Building.

Youngstown Enameling Sheets are of such high quality that the regular production could be used even for this most exacting work -- there was no need to make any special selection of sheets. That's because Youngstown treats all enameling sheets as an important specialty, makes them under conditions which are known to produce the best results. Youngstown Enameling Sheets are free from inherent strain, free of gas inclusions, their finish is uniform, and excellent adherence is possible with their evenly etched surface.

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6-5B

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THE
YOUNGSTOWN
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necessity of diagonal wind bracing in the walls.

Floors of practically any type can be used. For outbuildings in the South these are generally some form of prepared earth, or perhaps tamped gravel or slag. If a concrete slab on the ground is used the outer edge of this can be substituted for columns and footplate described later. For residences, several floor designs have been made, all supported by standard steel joists which consist of two 14-gage cold formed channels with 6-inch webs, and 2-inch flanges welded back to back. Joists span the full length of the building, are connected to the panel points, on 4-foot centers, and are supported as often as necessary to carry live and dead loads.

One subfloor design consists of 2 x 4 wood nailers on edge spaced 16 inches center to center, but notched over the flanges of the floor beams to extend 2 inches above. On these nailing strips is placed a standard wood floor over building felt either with or without a subfloor. A number of designs are possible whereby either cement of bituminous concrete is placed over various forms or reinforcing material, with plywood or composition floors cemented to it.

Steel frames may be bolted down to any type of brick or concrete wall, but to obtain uniform bearings, top of the latter must be finished more accurately to line and grade than is the case in conventional construction. The steel frames are assembled in precision jigs or master frames, and when bolted rigidly together form a structure without sag or warp in any part. When erected, the building will be square, rigid and in a plane.

To remedy frequent irregularities in the foundation and to simplify and expedite erection procedure, steel piers and footings have been designed consisting of a section of hot rolled channel, one end squared and welded to a steel plate as footing, the other end arranged with a slotted connection which provides for necessary adjustments to secure accurate grade. One of these piers and footings is provided at each panel point, and where indicated, under floor joists.

All insulation is placed inside the steel frame, considering the outside sheets primarily a weather break. Any type may be used. Fiber board ¾-inch thick gives excellent results in the South or Southeast for outside residential walls as proved by a full year's occupancy. Lighter weights are used for lining partitions.

Windows and doors are framed into the standard width panels in the shop and such panels come to the job ready to bolt in place. Purchaser has a choice of either standard steel casement or steel double-hung sash. In either case, sash frames are welded in place in the shop. Wood or steel door jams are installed in the shop. Doors may be either wood or steel. If wood, they are hung and trimmed in the field. Base board may be either wood or steel.

General impression is that the interior of a sheet steel building without insulation can become extremely hot. However, experiments show that with good ventilation inside temperatures are as comfortable as those in other uninsulated structures built of conventional materials. This again has been proved on the outbuildings erected for FSA. The steel structure will heat up more quickly in the morning, but in all cases temperatures in uninsulated buildings will soon approximate those outside. On the other hand, in the evening the thin steel will give up its heat almost immediately. It is also well known that certain metallic coatings, including galvanizing in combination with white or light-colored pigments, will reflect a large percentage of radiant heat of the sun.

Steel Is Protected

Protection of the steel is provided by: (1) Using galvanized sheets for all exposed surfaces; (2) coating the galvanized sheets with zinc-dust, zinc-oxide synthetic resin primer, baked on at 40 degrees Fahr. oven temperature; (3) coating black steel members with a zinc chromate protective inhibitive primer, also oven baked; (4) retouching scratches and breaks during erection with the same material originally applied; and (5) applying after erection one or more coats of good outside paint to all outside surfaces as a finish. With occasional renewal of the finish coat of paint and asphalt coating on surfaces exposed to the weather there is reason to believe that the steel will last indefinitely.

No attempt has been made to fabricate multiple-story units other than for erection of a hay loft type of barn with an eave height of 12 feet. A standard 4-foot wall or roof panel weighs approximately 8 pounds per linear foot, therefore, one 18 feet long weighs 144 pounds and approaches the maximum that can be handled readily by man power for erection. This limits convenient building width to 32 feet, or eight wall panels. In general, floor and ceiling panels for structures wider than 20 feet are made in two sections and spliced in the field.

Quite a range of prefabricated steel service units are available, such as porch design variations, pantry units, awnings, entrance roads and similar features that will enable group housing to be varied in appearance more widely than just through selections of field paint coats and elevations.

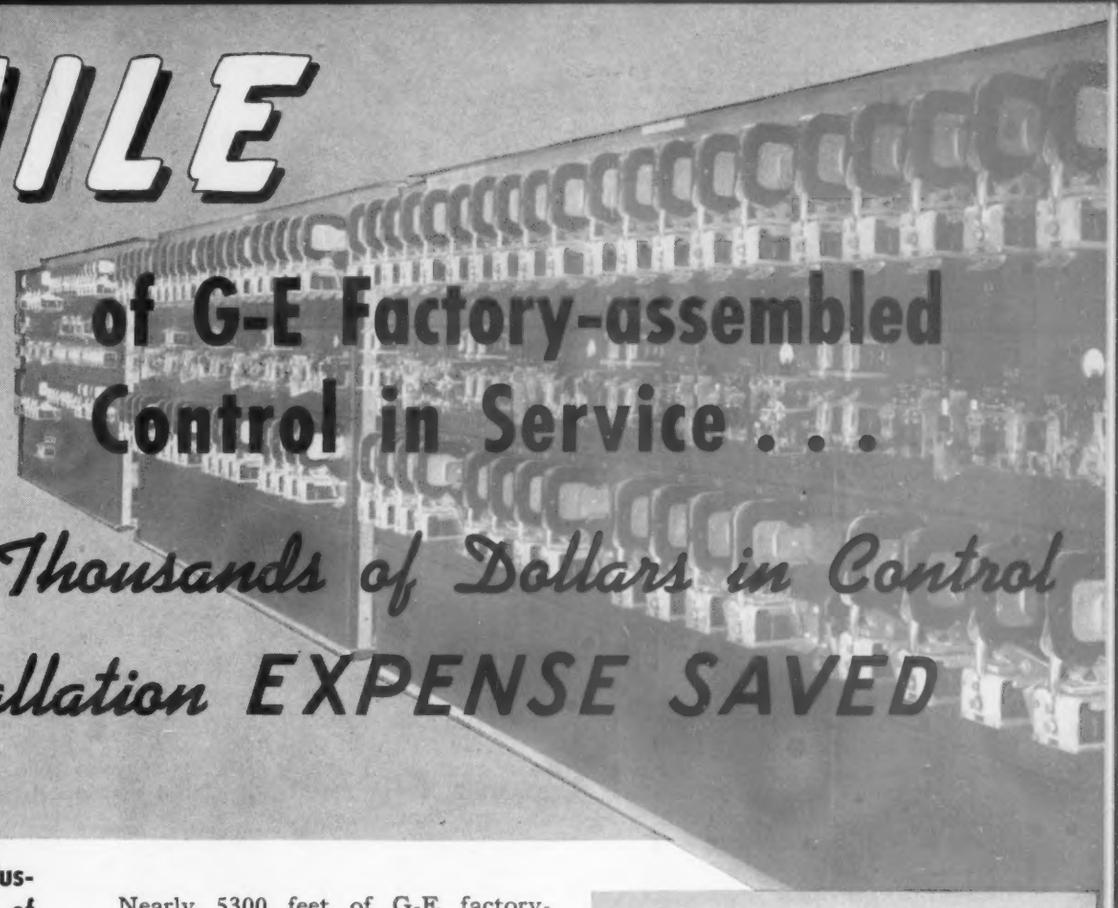
Heavy Steel Turbine Casting Is Flame-Descaled

This operator is flame-descaling an 18,000-pound steel casting for a hydraulic turbine. Flame-descaling is a relatively new process for removing the scale from blooms, billets, slabs, forgings and steel castings by means of specially-designed oxy-acetylene heating heads. The process is based on the principle that when a high-temperature, quick heating is applied to the scale, or oxide skin, on a piece of cold metal, the scale expands and breaks away from the base metal because of differential expansion between the scale and the steel. Photo courtesy The Linde Air Products Co., 30 East Forty-second street, New York

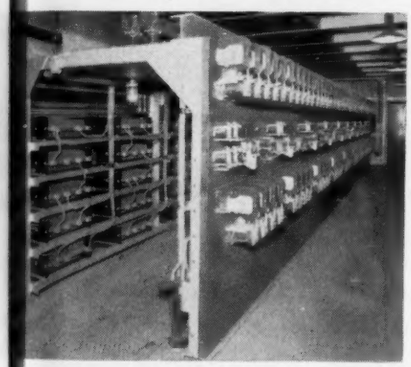
A MILE

of G-E Factory-assembled Control in Service . . .

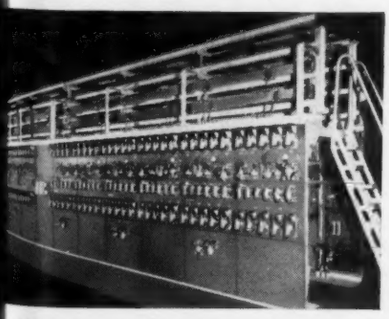
and Thousands of Dollars in Control Installation EXPENSE SAVED



These Recent Installations Illustrate Two Popular Types of G-E Factory-assembled Control



Here's the control board for screwdowns in a large steel plant in the Pittsburgh area. In this type of assembly the resistors are mounted at the back, making it easy to inspect the entire unit from the floor and to take out individual resistors without disturbing the others



This is the control board for auxiliary drives installed in a hot-strip mill in the Midwest. The unit consists of two groups of panels, arranged back to back, with the resistors for each mounted overhead. This arrangement cuts the over-all length of the installation in two and facilitates locating the control in the middle of the motor room or close to the motors

Nearly 5300 feet of G-E factory-assembled control in steel-mill service is impressive evidence that steel companies clearly recognize the great savings in installation time and expense made possible by *complete* factory assembly.

These companies have found that with G-E factory-assembled control (self-supporting type), it is only necessary to set the units on the floor and connect the power supply and leads to the terminals. The panels, main buses, and resistors have already been assembled on rigid, self-supporting framework and have been wired and tested. As a result, users have been able to save materially on *total* control installation expense.

The installation of this G-E control in a new mill just before the start of operations has saved valuable time at a crucial moment. And in plant modernizations it has helped to shorten the change-over period, lessening the down time of the mill.

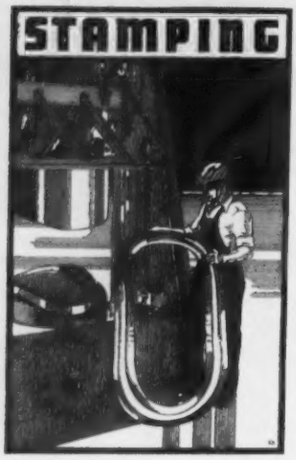
COMPLETE FACTORY ASSEMBLY MEANS:

1. Group of panels mounted on a framework is installed as a unit.
2. Resistors are mounted on same framework, each being wired to its corresponding panel. There are no resistor boxes to sort, stack, and connect.
3. Power bus is supplied with each panel group.
4. Each panel is connected to power bus. Only one power feeder must be connected to power bus.
5. Terminals are conveniently located at each panel for quick connection to outgoing motor and control leads.
6. Fewer shipping crates to handle.

Since the installation of the first units in 1935, G-E engineers have made continual improvements in the design and construction of factory-assembled control. Why not get in touch with our nearest representative and have him give you full information about it? General Electric Co., Schenectady, New York.

GENERAL ELECTRIC

660-200



Magnesium Alloys

Stamping, forming and working alloys of magnesium need not be difficult. Following the simple suggestions on latest approved practice as detailed here may be helpful in obtaining the best results

■ VARIOUS fabricating operations such as blanking, shearing, forming, bending, die drawing, spinning and extruding of magnesium alloys such as Dowmetal can be accomplished with comparative ease provided a few simple rules as outlined below are followed.

Blanking and shearing of thin sheet is carried out the same as with other metals. However, with sheet more than 0.065-inch in thickness, there is a tendency for the edge to have a flaky fracture. This is because magnesium alloys cold harden quite readily. Edge roughness of this sort should be dressed off before assembly to improve forming and fatigue characteristics as well as paint adhesion of surface.

Smooth edges on thick sheet can be obtained by blanking after the material is warmed to about 500 degrees Fahr. When heating for this or subsequent operations, dimensional changes due to shrinkage on cooling should be considered.

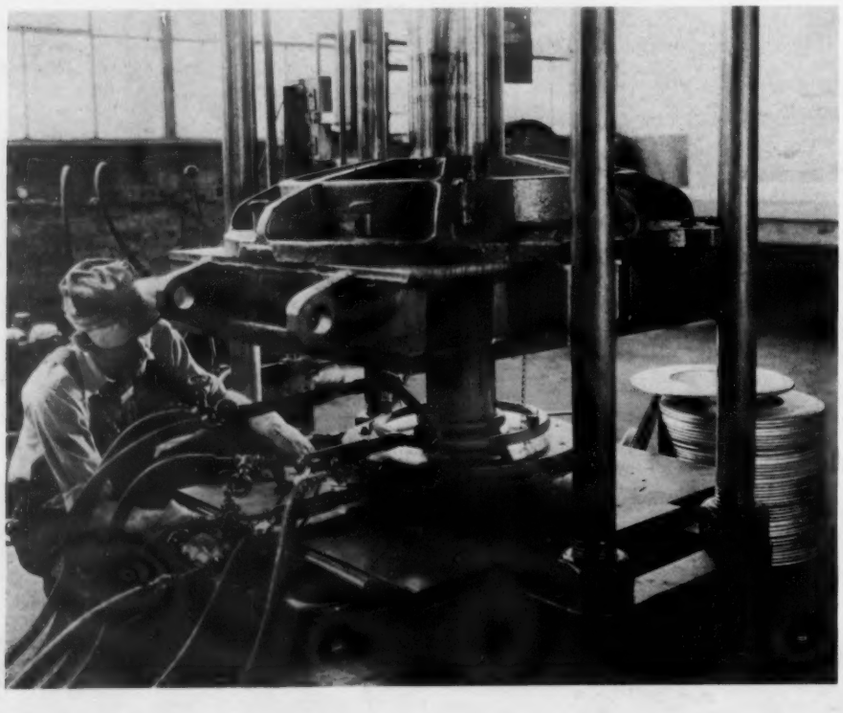
Punches should be ground with as little clearance as possible. Shear blades ground square with an included angle of 90 degrees and set up with as little clearance as can be used without scoring are recommended. Material over ⅛-inch thick should be band sawed rather than sheared. Magnesium alloys cannot be cut with the oxygen torch.

Within certain limitations, these alloys lend themselves readily to such forming operations as bending, drawing, pressing and spinning. However, application of some of these processes may involve slight changes from present practice on other materials.

Attention should be given to the severity of the operation and to the material being worked. Cold forming around small radii may give some trouble which can be avoided by increasing the radius by working the material while hot. Hot forming is best done between 500 and 750 degrees Fahr. The temperature should be checked with a contact pyrometer if possible. Blue carpenter's chalk will lose its color at about 600 degrees Fahr. and may serve as a rough indication of the temperature. Care should be taken not to exceed 800 degrees Fahr. as the metal becomes hot-short above this temperature.

Tools used in forming operations should be clean, smooth and well lubricated. Lard oil is generally a good lubricant since it stands the heat well and is readily removed from the formed stock by means of alkaline cleaners.

Abstract from the new *Dowmetal Data Book*, published by Dow Chemical Co., Midland, Mich.



Here a magnesium alloy is being drawn. Note ring-type heater units to maintain proper working temperatures for the material. Photos courtesy Dow Chemical Co., Midland, Mich.

Bending to Short Radii

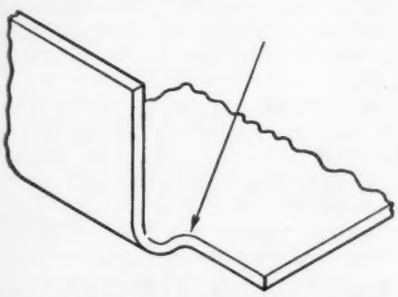
Bending around short radii successfully requires the removal of sharp corners and burrs from the edges of the sheet near the bend line. Bend line should not be prick punched as such marring of the surface may result later in fatigue cracks starting from these points. A carpenter's pencil has been found satisfactory for general layout work. Annealed Dowmetal sheet, type Ea or Ma, should be used where the best cold forming prop-

erties are required. With these materials, maximum bend radii of three times the thickness of the sheet may be obtained on small samples in all gages below No. 8, Brown & Sharpe.

It is recommended, however, that a bend radius of at least four times thickness of material be used in the shop and that an actual trial be made under shop conditions as the results frequently are influenced by equipment being used, direction of bend relative to that of rolling and method of operation. Slow deformation is better than fast, it has been found.

Hard rolled Dowmetal sheet, type Eh and Mh, can be given only a limited amount of cold bending. Such material usually may be bent around a radius of five to ten times thickness of material, the required radius tending to increase directly with sheet thickness and amount of cold working.

If hot forming at temperatures from 500 to 750 degrees Fahr. is employed, much sharper bends can be made than at room temperature.



Sketch showing recommended practice when flanging the alloy sheet. The arrow indicates where corner should be curved and edges rounded

Such heating causes the hard rolled material to suffer a decrease in strength and hardness and an increase in per cent elongation. Heating annealed sheet produces no change in its room temperature properties.

The time of heating should be just sufficient to heat the sheet thoroughly, which in any case should not exceed a temperature of 800 degrees Fahr. The speed of cooling of thin sheet in open air and the low heat capacity of the metal require rapid handling and the use of preheated tools.

Sheet to be hot formed preferably should be heated in an oven where the temperature can be controlled accurately. Dies for forming should be heated sufficiently to prevent chilling of the sheet. Local heating with a torch may be necessary in certain cases, though difficulty may be experienced in securing straight accurate bends due to unequal heating.

The above considerations apply to simple straight bends such as occur in forming angles, channels and similar uniform sections from sheet or plate. An accompanying diagram shows good practice when turning up a flange over part of the length of a sheet. It is important to drill a hole or otherwise fillet the inside point of the cutout corner to prevent a crack starting at this point. The hole can vary from ¼-inch on thin stock to perhaps ½-inch in diameter on heavy gage material.

Bends may be made in most standard types of metal brakes, although press type machines are generally superior. Any machine must be set up to allow the proper radius in the bend. Parts contacting the alloys should be smooth and lubricated. Heating of these tools to permit hot forming may present some problems such as prevention of warping and misalignment of the machine. However, both gas and electric heat have been used satisfactorily.

Allowance for Springback

Extremely little springback occurs on hot-worked material. Cold-formed parts exhibit some springback for which allowance should be made in making the original bend.

Cylindrical tank shells are usually formed cold in conventional bending rolls. No special precautions are necessary except when bending close to the upper roll diameter. In this case, some heat may be necessary. Care should be taken not to press the rolls too closely together as the usual crown in the upper roll may form some deformation of the softer sheet so a true cylindrical surface will not be obtaned.

Long parts of uniform cross section including angles and channels also may be made by roll forming or by drawing the strip through forming dies. The same general considerations as to bend radii and other working conditions apply. If heating is required, care must be taken to assure uniform temperature throughout.

Roll forming and die drawing are generally used for the production of shapes whose wall thickness is such that extrusion is not practical.

No Abrupt Contour Change

In designing rolls for this type of work, abrupt changes in contour between rolls should be avoided. Drawing dies likewise should change gradually in contour. Either steel or cast iron can be used for roll or die material. All such surfaces contacting the Dowmetal should be kept smooth to prevent scratching. Magnesium alloys have been used successfully for dies and rolls on production jobs where a limited number of parts are required. Such practice is economical because of the ease with which these alloys are machined.

Hand forming without dies may be accomplished easily by clamping the edges of the sheet in a soft-jawed vise or suitable clamp. While keeping the sheet at proper working temperature, it is hammered to the desired shape with a wooden or leather maul. A leather pillow

Extrusion of the alloy is handled in huge machines such as the one shown here

filled with sand will be found satisfactory for forming small work where the deformation is not severe enough to require hign working temperatures.

When quantity production is not required, parts may be shaped by hand over hardwood forms. When warranted by quantity requirements, dies can be made from magnesium-alloy castings or plate. Such plate can easily be band sawed to desired shape and requires a minimum of labor to finish up. Dowmetal sand castings are used for more complicated forming dies with contoured surfaces. Besides being economical to construct, such dies present the same thermal expansion characteristics as the material being worked and can be heated and maintained at proper working temperature using gas, electricity or an acetylene torch. Work is clamped to the hot die and hammered into shape as described above.

Power Pressing and Drawing

Power pressing and drawing can be done on Dowmetal. While each case must be considered individually, draws and pressings of medium depth can be made quite successfully. Best results have been obtained by heating the dies, although some of the less severe draws can be made cold. Dowmetal or steel dies may be used. Dowmetal, however, has the advantage that it possesses equal expansion with the material being formed and is easily machined, thus making for economical construction. Also its light weight promotes easier handling.

Design of dies for magnesium alloys follows closely that for other metals; in fact, it is possible sometimes to use production dies made for other metals if the forming is not severe enough to require heating. However, it is generally necessary to make provision for heat application. Ring-type gas burners are being used successfully to maintain temperatures between 600 and 700 degrees Fahr., while small dies can be heated electrically or with an acetylene torch.

Corner radii always should be as liberal as possible. Dies should be well lubricated with materials that will withstand the usual working temperatures.

Spinning at the present time has been done to only a limited extent. Spinnings, involving moderate deformation from the flat sheet, are being used commercially. Jobs demanding more severe forming require heating to between 500 and 600 degrees Fahr., which often is done by applying a torch to the sheet while it is rotating. Lubrication is necessary, a laundry soap or a mixture of two parts tallow and one part paraffine being recommended.

Forming of extruded shapes such as angles, tees, etc., may be done in the usual manner. Heat, however, should be employed if the operation is too drastic to be done cold.

Special sections and shapes may be made by heating and forging to Dowmetal or cast iron forms. A wooden maul is recommended in place of a sledge hammer as less marring of the surface will result.

Tubing of magnesium alloy material can be bent into coils or other shapes by usual methods. Thin-walled tubing can be prevented from buckling by filling it with sand. Regular pipe bending machines using an internal mandrel are successful. Small-radius bends may necessitate heating. Wood forms can be used but should be metal faced if the tube is bent hot.

New Metal Specifications Approved By A.S.T.M. Standards Committee

■ COMMITTEE E-10 on standards of the American Society for Testing Materials met in Philadelphia recently and acted upon a large number of recommendations from standing committees on metals. Many new important specifications cover materials on which A. S. T. M. had not previously issued standardized requirements. The standards committee has authority to approve proposed new tentative standards for publication, revisions of existing tentative standards or tentative revisions of existing standards in the interval between society annual meetings.

While a number of the actions resulted from desire of committees to have their existing specifications and tests in the best possible shape for inclusion in the 1939 Book of A. S. T. M. Standards to appear in November, many of the actions or recommendations on new standards resulted from work under way during the past year or more.

Of 13 recommendations which had been approved by letter ballot of committee A-1 on steel following its Atlantic City meeting in June, 9 were proposed new tentative specifications, six of which resulted from work inaugurated during the past year in the field of spring wire—for which there has been a lack of standardized specification requirements. New spring wire specifications cover the following: Hard drawn spring wire (A 227-39 T); oil-tempered spring wire (A 229-39 T); music spring wire (A 228-39 T); chromium-vanadium spring wire (A 231-39 T); carbon valve spring quality wire (A 230-39 T); and chromium - vanadium valve spring quality wire (A 232-39 T). Tensile properties of the wire vary from 150,000 to 440,000 pounds per square inch, depending upon the diameter, composition, etc.

New tentative specifications for carbon-steel forgings (A 18-39 T) provide for nine classes of material depending upon use and heat treatment. These specifications resulted from an effort to consolidate into one document various requirements for carbon - steel forgings. Tensile strength ranges from 47,000 pounds per square inch in the untreated range, all sizes, to 90,000 pounds in Class G (quenched and tempered) 4-inch maximum outside diameter, 2-inch maximum wall thickness. Minimum yield points range from 25,000 to 55,000 pounds per square inch.

Other new specifications developed by the steel committee cover electric-resistance welded steel boiler and superheater tubes for high pressure service (A 226-39 T) with wall thickness range from 0.085 to 0.360-inch; also requirements for manganese-vanadium steel plates for boilers and other pressure vessels (A 225-39 T) with two grades, A and B (tensile strength 70,000 to 82,000 and 75,000 to 87,000 pounds per square inch, respectively. Minimum yield points are 40,000 and 43,000 pounds, respectively.

Other recommendations of committee A-1 included revision of tentative specifications for seamless carbon-molybdenum alloy-steel pipe for service at temperatures from 750 to 1000 degrees Fahr. (A 20638 T) to provide for a grain growth test for this pipe when subjected to water quenching treatment and also to incorporate certain requirements for photomicrographs.

On recommendation of committee A-3 on cast iron new tentative specifications for cast-iron soil pipe and fittings to replace the present standard (A 74-29) were approved as well as new specifications for cast iron pit cast pipe for water or other liquids replacing specifications A 44-04 which have stood since 1904 without revision.

Committee A-10 on iron-chromium, iron-chromium-nickel and related alloys has been studying for some time a guide for conducting plant corrosion tests. After several revisions in committee it was approved

by letter ballot and is now to be issued as tentative recommended practice. This guide outlines a procedure for conducting corrosion tests in plant equipment under operating conditions.

It is not intended for atmospheric or underground corrosion tests but may possibly apply to other tests under natural conditions where procedure has proved satisfactory. Corrosion testing by its very nature precludes possibility of complete standardization. Practices are presented as an aid to those conducting corrosion tests so that some of the pitfalls of such testing may be avoided. Intended not as a standardized procedure but merely as a guide, it covers apparatus for mounting specimens and their preparation, duration of a test, cleaning of the specimens, examination before and after test, reporting, etc.

In the nonferrous metal field, recommendations from committee B-1 on copper and copper-alloy wires for electrical conductors were approved covering new tentative specifications for soft rectangular copper wire (B 48-39 T) to replace immediately existing standard (B 48-38). The new tentative specifications recognize two classes of rectangular wire, one class being suitable for all applications except possibly those involving extreme edgewise bending; the other class being particularly applicable for edgewise bending purposes.

Bending Tests Proposed

A bending test is incorporated in the proposed specifications for this latter class of material, in place of the tension test prescribed for the other class of material. Elongation values for the tension test prescribed are increased and certain modifications are made in the permissible variation of dimensions in order to bring these requirements more nearly in line with present practice.

Specifications covering flat commercial rolled nickel-copper alloy for purposes for which material of this composition is applicable (B 127-39 T) were approved on recommendation of committee B-2 on nonferrous metals and alloys. Material with a nickel range of 63 to 70 per cent is considered suitable for the general run of drawing, forming, stamping, bending and joining operations. Tensile strength for annealed, quarter hard, and hard, stress-equalized classes of cold-rolled sheet and strip are, respectively, 70,000 to 80,000, 75,000 to 85,000, and 100,000 pounds per square inch, min. Tensile range for plate (¼-inch thick and heavier) is 70,000 to 85,000 pounds in annealed condition.

Recommendations by committee B-5 on copper and copper alloys, cast and wrought include a revision in specifications for copper-silicon alloy plates and sheets (B 96-36 T) changing the tensile strength for the annealed material from 50,000 to 64,000 pounds to 50,000 to 67,000 pounds per square inch because of necessity of meeting a minimum yield strength requirement of 18,000 pounds.

For the first time the society approved requirements for aluminum-manganese alloy sheet and plate for use in welded pressure vessels (B 126-39 T). This specification was developed in response to a request from the A. S. M. E. boiler code committee. For purpose of their work, the committee considered it desirable to have a specification which covered specifically the grade and tempers which shall be used for their purpose rather than to depend upon individual designers to select a temper from the general A. S. T. M. specifications for aluminum-manganese alloy sheet and plate (B 79-38 T), which covers all of the commonly used tempers of the alloy but does not include the quarter-hard temper because of limited use.

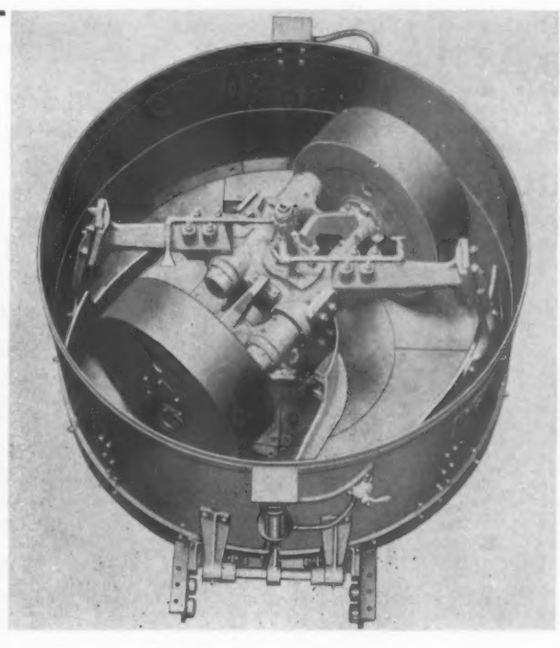
Because of the rules governing preparation of micrographs of metals and alloys including recommended practice for photography as applied to metallography (E 2-36) were in need of revision, having stood unchanged for three years, the committee in charge, E-4 on metallography, submitted proposed tentative rules which replace the existing standard and which will carry the designation E 2-39 T. Changes were rather extensive and it was felt a new standard was desirable to replace the older one. These rules which are of widespread service cover such items as standard magnifications, reproduction of micrographs, lenses, method of measurement of grain size, use of grain size in specifications. In the section on recommended practice for photography as applied to metallography, material is divided into the following: Magnifications, lenses, illumination of specimens, photographic materials.

Proposed tentative standard for classification of austenite grain size in steel which carries the designation E 19-39 T will replace the existing items, E 19-33 and E 19-38 T. The new standard makes use of the present two sets of charts, one of them in idealized form, intended to be used with any procedure for determining austenite grain size, and the other consisting of a series of photomicrographs showing the structures found in the carburized case in a carburizing (McQuaid-Ehn) test. These two charts cover the same range of sizes, with identical designations (Nos. 1 to 8), the use of one or the other being a matter of individual preference. The manner of making the grain size test may of course determine which chart will be used.

The standards committee acting on proposals made by committee E-7 on radiographic testing approved new tentative recommended practice for radiographic testing of metal castings (E 15-39 T) which will replace immediately the present standard E 15-29. The older practice has not been changed for several years. This method covers general considerations, defects that may be revealed by radiography, radiographic equipment, and radiographic technique—each of these sections being classified under X-rays and gamma rays.

Sand Mixer

■ **This large sand mixer 9 feet 3 inches in diameter is capable of preparing a 5000-pound batch of sand in two minutes. Mullers weigh 5500 pounds each. Mixer is equipped with anti-friction bearings throughout and has an integral drive powered by a 60-horsepower motor. Photo courtesy National Engineering Co., 549 West Washington boulevard, Chicago**



Aircraft Heaters

Investigation points way to important savings in production cost of units which must withstand severe operating conditions. Average service life is extended from 75 to 450 hours, thus eliminating service interruptions

By **L. J. CAREY**
Foreman
And
MARVIN WHITLOCK
Engineer
American Airlines, Inc.
Chicago

■ POSSIBLY the most important item contributing to the comfort of air travel is heating of the cockpit and cabin. Such heating is a year around necessity as it is common to encounter 5 or 10-degree weather at high altitudes when the temperature on the ground is 95 or 100 degrees above zero. The heating system must first of all be safe and also must be dependable, efficient, lightweight and easily controlled.

Fig. 3, perspective view, shows a modern airliner heating system to consist essentially of a boiler in the exhaust stack of the right engine, a radiator in the air supply duct, a reserve water supply tank in the right cargo compartment, and the necessary valves and controls to effect safe and efficient heating. The boiler operates as a dry boiler, admitting water only when there is a demand for steam in the radiator. Under normal operation, the radiator is always full of steam and the reserve water tank supplies water to the boiler as needed to maintain steam in the radiator. As the steam in the radiator gives up its heat to the air flowing through the radiator, the steam is condensed and flows back to the boiler.

Failure of the boiler immediately causes the entire system to be inoperative, resulting in an uncomfortable and sometimes an unbearable low-temperature condition in the cabin.

Fig. 1 illustrates the Douglas DC-3 boiler unit complete with upper and lower sumps. Conditions under which such a boiler operates are extremely severe. Operation affords a cycle of quickly applied heat, normal heated operation, and back to a rapid cooling condition, all of which impose extreme expansive and contractive conditions on the metal.

Also the unit operates both as a wet system and as a dry system. In addition, extreme vibration is present since the boiler is mounted on the exhaust stack fastened to the engine. Development of a satisfactory boiler to meet these requirements thus was no small matter.

Two years of preliminary experiment established that the tubular boiler shown was the only type that had sufficient capacity to provide the required heat. Titanium stabilized 18-8 stainless steel gave the longest service. In spite of many improvements, up until the summer of 1937, American Airline's boilers, which were of the latest type, were averaging only a mere 75 hours in service.

Boiler Upkeep Expensive

Boilers originally cost $195 each, could be repaired about four times, each repair costing $20. This totaled $275 for five service periods, or $55 per 75-hour period. With 30 planes flying 215 flying hours per day, the average of 2.87 boiler failures per day made heating system boiler expense $157.85 per day, or $57,600 per year for this one item.

Some changes in material and design practically eliminated failures of all parts of the boiler except the boiler tubes. Attention was concentrated on the tubular section. Method of fabrication is to bend the ½-inch D.X. 065 W. stainless steel tubing into shape and to bring the tubing ends through the ⅜-inch header plates. Protruding ⅛-inch on opposite side, these tubes then are welded to the top side of the header plate in rosette fashion, burning off the protruding end. The weld starts

Abstract from paper receiving Fourth Grand Award, $7,326.46, in $200,000 Program sponsored by James F. Lincoln Arc Welding Foundation, Cleveland.

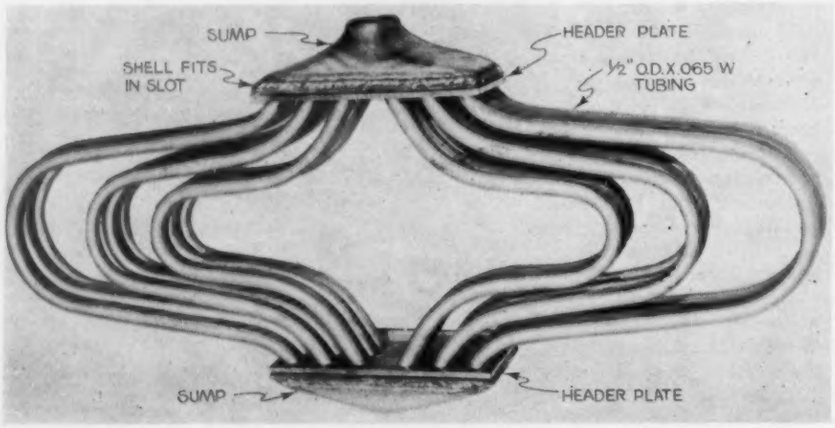


Fig. 1—Airship boiler unit complete with upper and lower sumps

out as fillet weld but actually develops into a corner weld. The sumps or covers then are welded into position on the header plates.

Due to differences in thickness of the materials it was necessary, with the former method of fabrication, to preheat lower side of header plates while tubes were welded on other side. Tube ends were brought to a high temperature. Two men were necessary. It also was noted that there was high carbide precipitation when welded in this manner.

After welding, the unit is subjected to internal air pressure and submerged in water to test for leaks. Due to the inconsistency of the welds made by the former method, it was not uncommon to reweld a boiler seven or eight times before a satisfactory test was obtained. Each time a boiler was rewelded, it was reheated which took time and labor and was detrimental to the steel.

Cracked Around Welds

Through close observation, it was noted that majority of failures occurred in the form of a crack extending completely around a boiler tube in the immediate vicinity of the welds which also are in a section of the tubing bend. In other words, in heating the ends of the tubes and the header plates to a red heat with subsequent irregular cooling, the material was subjected to internal stresses under which no material could possibly give service especially when accompanied by such severe additional conditions, as encountered here.

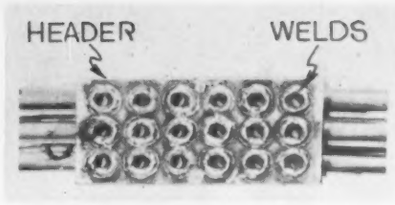


Fig. 2—Close-up showing how tubes are welded into header plate

Practical tests of arc welded construction were made. Four short pieces of tubing were welded into a header plate in the usual manner. Two were arc welded and two were welded by the former method. Assembly was placed in a hydraulic press to give a direct end load on the short pieces of tubing and a subsequent shear load on the welds. The two tubes welded by the former method sheared off at the weld, one under 2½ tons and the other under 3½ tons pressure. The two arc welded tubes were loaded to 8½ tons before the tubing collapsed, with welds unaffected.

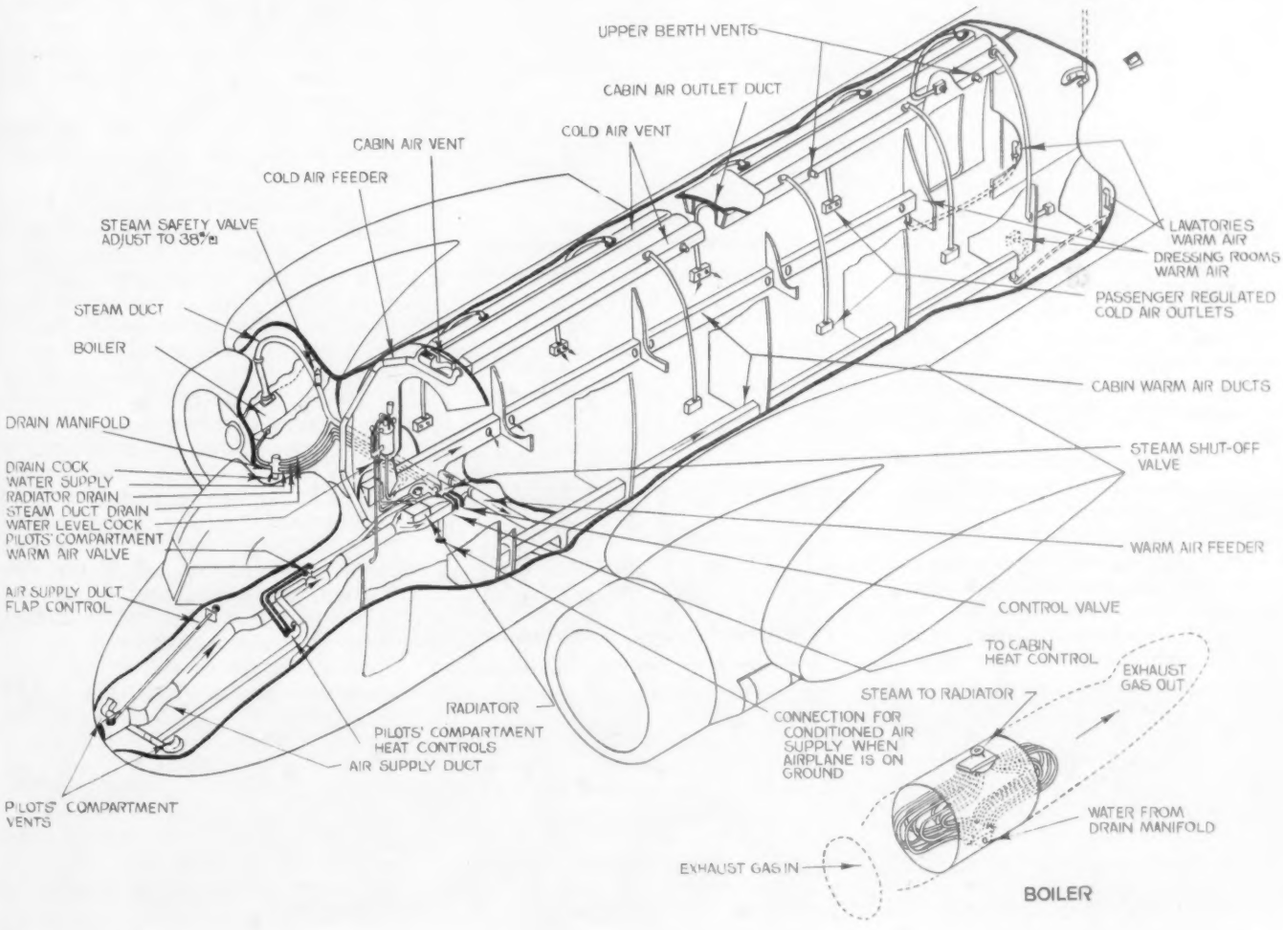
First boiler was arc welded in 40 minutes. One small pin hole leak was found when the boiler was tested. This was easily repaired, and the total time for welding, testing, and repairing was exactly one hour against eight hours time required previously.

Put into service, this first boiler operated continuously without repairs for a total of 420 hours, which was extremely gratifying in view of the 10 and 15 hour periods of experimental boilers, and average 75 hours on units then in service. Fifty more boilers were arc welded. These averaged 376 hours of flying, a great improvement over the previous average of 75 hours.

Service Greatly Improved

In addition to the actual monetary savings, service of the boilers was improved to the extent that during the winter of 1937-38, the superintendent of maintenance received an average of only 13 trouble reports a month as compared to an average of 40 per month for the previous winter. This improved service was of an inestimable value from the passenger reaction standpoint, and American Airlines built up a nation-wide reputation as having

Fig. 3—Perspective view of modern airliner presenting details of heating and ventilating system



solved the heating system problem.

Drawings and sample boilers were furnished to four largest competitors and to the War department. Cost is $125 each instead of the former $195, decreased price being due primarily to shorter time required by the arc welding process.

American Airlines could construct the boiler for $168.16, instead of buying them at $195, using the old method of welding and get the same amount of service as with the factory made units. With arc welded boilers this shop cost was decreased from $168.16 to $106.94 each.

Service life was increased to a consistent operation of 450 hours at which time the boilers are destroyed. These figures show that American Airlines is saving $38,950 per year over former factory prices on heating boilers for this type plane. Under same conditions, saving to the industry would be $253,674 yearly.

Savings shown and improved service mentioned were not due entirely to use of arc welding because no doubt improved welding and fabrication technique, changing of angle that tubes enter the header plate, and other items contributed. However, arc welding appears the major factor. Definitely the decrease from $168.16 to $106.94 in shop costs was due entirely to use of arc welding, although the increased life may have other factors entering.

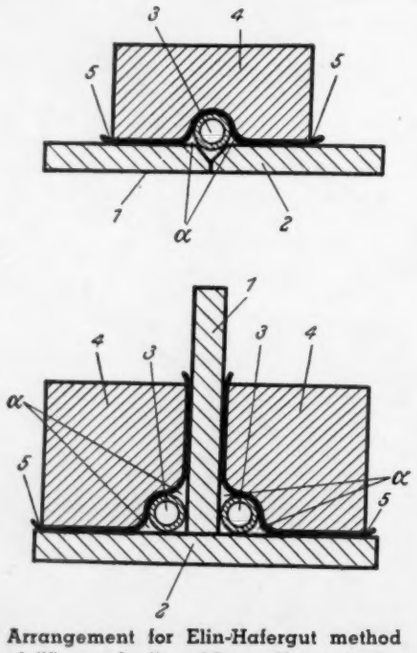
"Firecracker" Welding Has Improvements in Procedure

■ SINCE THE customary automatic arc welder is relatively high in first cost and requires fairly expert attention, the simple "firecracker" method of automatic arc welding has been brought once again to the fore, according to *The Welding Journal*, published by American Welding society, New York. The firecracker method was described in a patent in 1912 in the following terms: "an electrode covered with suitable fusible insulating covering is laid along the whole length of the joint, the insulation being of such a thickness that the electrode is held at the right distance from the work. One end of the electrode is exposed. The arc is struck between electrode and work and slowly travels along the joint. The insulation, formed of asbestos smeared with sodium silicate, aluminum silicate or the like, fuses and forms a flux." Similar processes have been described by others since then.

Unless special precautions are observed, however, the firecracker process is difficult to apply. The electrode may twist out of the scarf owing to the heat of the arc and the resistance of the electrode may lengthen and extinguish the arc. Inadequate current will quench the arc or give too little penetration. Too large a proportion of the electrode spatters away if the current is excessive.

All disadvantages disappear if a suitably shaped bar of copper, see accompanying illustrations, is placed over the electrode. A strip of any sort of paper is inserted to separate the copper from the base metal and electrode. Spatter is prevented and the short arc, determined by the thickness of the coating, yields the best penetration. The electrode melts in the small space allowed by the bar, combustion of the paper removing oxygen from the welding atmosphere. The welds are said to be more uniform than those produced by manual or other automatic processes and have satisfactory mechanical properties.

In applying this patented process a space, *a*, must be provided for the slag, otherwise the arc may be quenched or the weld may be full of slag inclusions. Electrodes 5 feet long have been used. Longer electrodes of a wide range of compositions have been deposited using the same polarity and current as for manual welding. Excellent welds have been made with electrodes 0.08 to 0.47-inch in diameter.



Arrangement for Elin-Hafergut method of "firecracker" welding. Upper is for butt welds; lower for fillet welds; 1 and 2 are materials to be welded; 3, covered electrode; 4, copper bar to cover electrode; 5, sheet of paper inserted between electrode and copper bar; a, space for slag

One unskilled operator can manage "firecrackers" at four locations simultaneously. He draws an arc at one electrode with a metal or carbon rod. While the electrode is being deposited (3 to 5 minutes for an electrode 5 feet long, depending on diameter), he sets other electrodes in position and draws the arc. Only 10 per cent of the welding time is occupied in water cooling the copper bars and in placing them over other electrodes.

Coatings For Magnesium Alloys

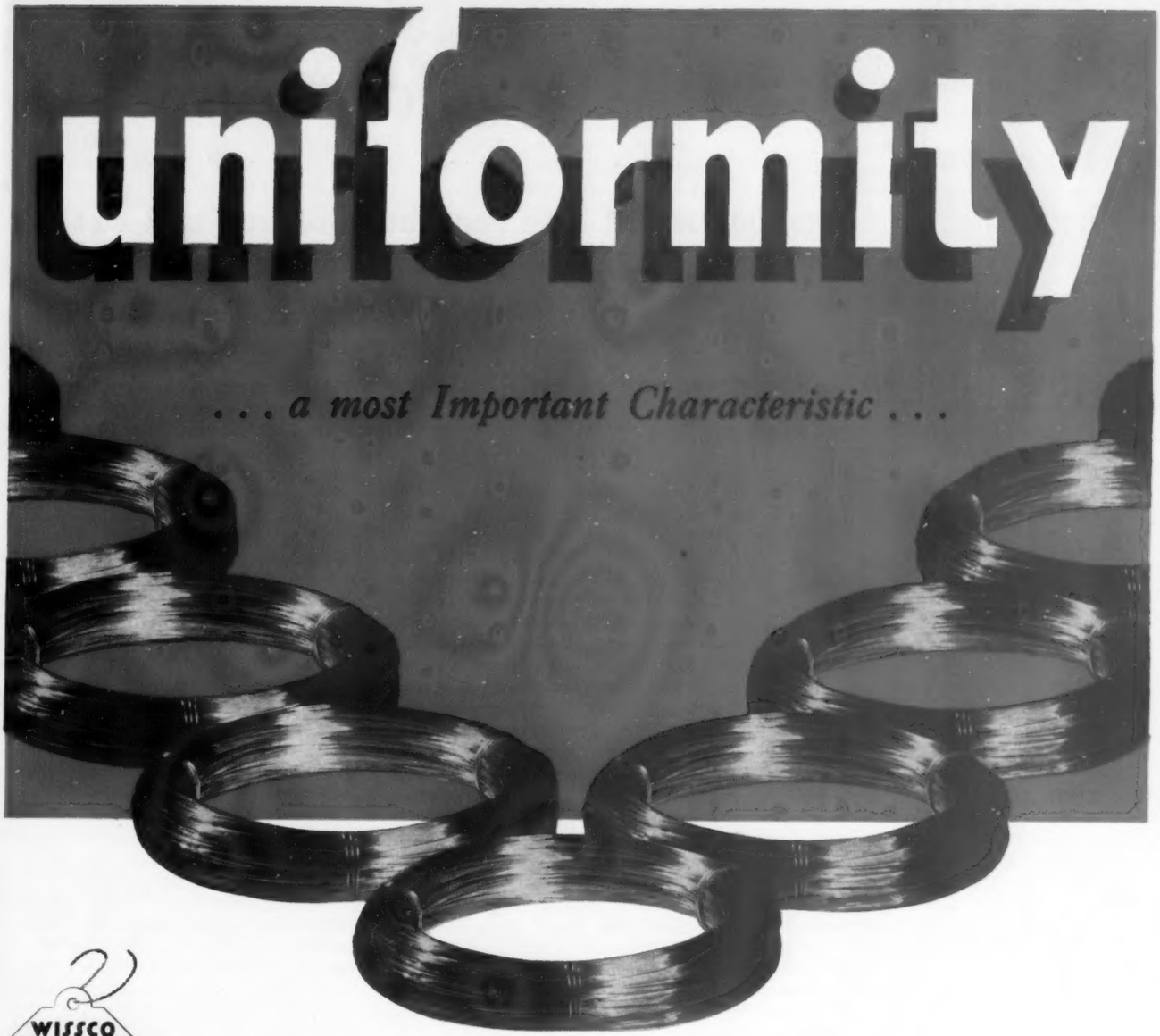
■ New protective and decorative coatings for magnesium alloys have been developed by Dow Chemical Co., Midland, Mich. They afford maximum protection against salt water. General atmospheric exposure develops satisfactory adhesion surfaces for subsequent paint systems. Known as Treatments Nos. 7 and 8, the coatings may be used on parts machined to close tolerances since they introduce no dimensional change.

Treatment No. 7, usually applied to Dowmetal parts after machining, imparts a dark brown to black finish on most alloys and may be used on all except Dowmetal M. Treatment No. 7 finds its greatest application in the aircraft field. Treatment No. 8, used on all alloys and forms including Dowmetal M, leaves machined surfaces with their original lustre. The protective coating known as Dow No. 6 is a dye coating produced in water solutions at high temperatures and pressures to obtain various colors. The coating can be furnished in colors ranging from yellow, red, blue and green to metallic lustres such as bronze and brass. Its greatest use is for decorative treatments, and it may be used to protect parts which cannot be conveniently painted.

All straightening rollers are readily adjustable, making it possible to use rollers which have been redressed many times and still maintain the center line of bar with center line of machine in perfect alignment. All rollers are mounted on antifriction bearings and may be quickly changed by removing one cap screw on each roller and the retaining cap.

uniformity

. . . a most Important Characteristic . . .



Today, uniformity of all raw materials is of far more importance to the manufacturer than ever before. He must make the most of his economies from production speed . . . without machine stoppage, tool breakage or product spoilage. We know this and work to the end that Wissco Wire be as uniform as it is humanly possible to make it uniform, with every mechanical and scientific aid. The fact that we perform every function within our own plants in the making of WisscoWire enables us to exercise every care to insure its uniformity. When a Wissco Wire is developed to meet your particular requirements, you get exactly the same wire every time you re-order.

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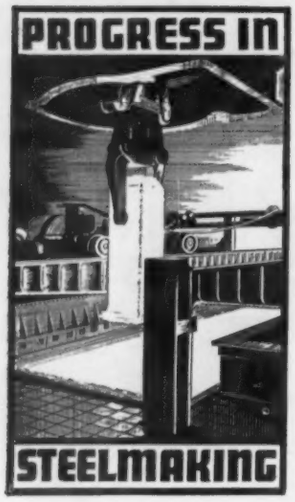

Mill Developments

Are detailed at 35th convention of iron and steel engineers in Pittsburgh . . . Basic-magnesite brick recently used over tap hole in open hearths to prolong life . . . Composite energy-consumption curves for wide range of cold-rolling setups are developed

■ USE OF vacuum in batch mixers to remove air, a new development, affords the manufacture of silica-alumina brick of denser structure according to a paper by J. S. McDowell and J. P. Bankson, Harbison-Walker Refractories Co., Pittsburgh, presented at the combustion engineering session, Association Iron and Steel Engineers, William Penn hotel, Pittsburgh, Sept. 26-29. A report of earlier technical sessions was presented in last week's issue of STEEL, page 49.

Mr. McDowell drew attention to a radical change in the use of basic brick in open-hearth practice, namely the recent use of basic-magnesite brick over the tap hole to prolong the life. He mentioned the use of superduty clay brick in soaking pits and in the roof and sidewalls of many of the new heating and processing furnaces as well as insulation to backup the walls. Forsterite, a synthetic development of olivine rock and magnesite, he explained, is basic in character and had a higher fusion temperature than silica brick. The speaker recommended it for bulkheads and ports in open hearths but not for sections subjected to slag boil.

Plastic Lined Furnace

Discussion brought out details of a low-head billet heating furnace at the Laclede Steel Co., Alton, Ill. now operating on a plastic lining. The unit, 40 x 40 feet and oil fired, has 9 inches of plastic on the hearth, 7 inches on the sides and 5 feet high. Life of sidewalls has been doubled. The first lining of this type gave a run of 3 years at a lower cost than previous linings.

Factors affecting the heating of steel and other problems, such as blooming mill defects were presented by E. E. Callinan, combustion engineer, and Gilbert Soler, director of research, Timken Roller Bearing Co., Canton, O. Except where an alloy has produced a change in the structural properties of the ingot, the heating temperature in soaking pits is predominantly a function of the carbon content, as in plain carbon steels, Mr. Callinan explained. Teeming rates and temperature have an important bearing on surface defects. Heats produced at fast pouring rate give much better rolling. The authors recommended the standardization of typical defects.

Carbonization Products Discussed

Yields and quality of carbonization products from various coals as determined at low, medium and high carbonizing temperatures by a standard test method developed by the bureau of mines and the American Gas association were explained by J. D. Davis, senior fuels chemist, Bureau of Mines, Pittsburgh.

Carbonizing temperature has a pronounced effect on the yields and properties of carbonization products. As the temperature is raised from 500 to 1000 degrees Cent., the yield of gas increases from 2400 to 11,900 cubic feet per ton. However, its heating value decreases in about the same proportion. The yields of tar decrease rapidly with increasing carbonization temperature. Yields of coke decrease and tend to approach a constant value at the 800 degrees Cent. effective wall temperature. Coke of best quality is produced at this temperature; at high temperatures development of shrinkage cracks tend to weaken it.

H. W. Johnson, superintendent, blast furnaces, Inland Steel Co., Indiana Harbor, Ind., in presenting the details in the design of his company's new stack, pointed out that better heating and reduction of ore is afforded by making coke provide the proper voids across the entire stock column. He presented data to show that the percentage of reduction is greater when large coke is used in the burden than when the smaller sizes are used. With 4-inch coke, reduction is 35.9 per cent; 3-inch, 25.7 per cent; and 2-inch, 16.8 per cent.

He mentioned that between 4 and 5 per cent of minus 1⅛ inch coke is produced between the coke plant and the blast furnace with careful handling. To prove the importance of screening out the fines he cited operating data with the grizzlies shut down and with them operating. The average tonnage produced by the stack with the grizzlies idle was 778 compared to 822 when they were in service. At the same time the coke consumption increased from 1722 to 1834 tons.

Trend Toward Higher Stacks

Mr. Johnson pointed out the trend toward higher stacks. The greater the height of the furnace, the greater amount of hanging and slipping. Irregular movement of stock is damaging, so that what is gained by adding height is frequently lost by greater furnace irregularity, he explained. But as the diameter of the furnace is increased, there is less friction on the walls per unit of volume, less chance of arching, and it is possible to build the larger furnaces higher without experiencing any additional irregularity.

Mixing hot and cold blast frequently results in a differential on opposite sides of the bustle pipe of 500 degrees. More uniform temperature of hot blast entering the furnace is secured by introducing cold air in the bottom of the hot blast valve at each stove than by using the conventional type mixing valve.

So far as known there are no

welded blast furnace shells in this country. But L. J. Gould, assistant chief engineer of construction, Bethlehem Steel Co., Bethlehem, Pa. told how his company installed a welded shell while a regular relining of the furnace was in progress. The job was executed in 56 eight-hour turns. Total man-hours was 13,000 and the quantity of welding rods used 2900 pounds. The shell is free from vertical buttstraps, is easier to clean and paint and requires less cutting of the brickwork.

At the electrical engineering session, F. Mohler, electrical engineer, steel mill section, General Electric Co., Schenectady, N. Y., in his paper, "Gage Control for Cold Strip Mills," emphasized the increasing importance of the subject of proper gage control. The interrelation and complex causes of gage variation involve a multitude of factors, and not too much is known of their relative importance. In his paper Mr. Mohler dealt with combined effects of these causes and means for their control.

Gage Variation

The dominating causes of gage variation appear to be roll shape, cooling solution, lubrication, speed, variations in incoming strip and in tension. The combined effect of the various causes of gage variation differs radically during acceleration and deceleration and also as compared to the steady rolling condition obtained at running speed. Results of much observation indicate variation in the incoming strip is the predominant factor when rolling at full running speed with the combined effect of variations caused by different rolling speeds becoming predominant during acceleration and deceleration. If a mill is set up to be on gage at a certain speed, the gage will become heavy if speed is decreased and light if increased. This is true during acceleration and deceleration as well as at a steady speed.

While there appears to be no exact explanation of this phenomenon, it is believed to be due to variation in degree of indentation of the working roll, in roll temperature, in lubrication and also in rate of deformation.

Thus, it appears first consideration to reduce off-gage material is to obtain fast acceleration and deceleration and use as large coils as possible to obtain long running times at constant speed. This not only cuts potential off-gage material to a minimum, but also increases production.

To reduce off-gage material during acceleration and deceleration, tension may be varied, increasing during acceleration. Tension should be greater at threading speed and gradually taper to the running value as the mill is brought up to running speed. This may be accomplished by counter-electromotive-force exciters in the motor field or by booster generators in series with motor armatures.

Fundamental requirements for good gage control appear to be good hot strip, large coils, shunt-wound motors rated on a 40-degree force-ventilated basis and in accordance with the schedules to be rolled. Their speeds and inertias should be selected so a maximum of 40 per cent current is not exceeded when accelerating them together with their respective mills to maximum speed in ten seconds. Also, for good gage control, tensiometers should be used to indicate the tension between stands. Vernier rheostats are necessary to adjust accurately the speeds and tensions between stands.

Provisions should be made for tapered tension control to obtain increasing tension between stands at threading speed and to taper gradually the tension to the running value as the mill is accelerated. Inertia compensation should be employed when higher than recommended accelerating currents are used or when the inertias of the motors are not matched properly. Also it is suggested that automatic gage control, screwdown followup control for No. 1 stand and line boosters be installed for best results.

Electric Devices Not a Cure All

Mr. Mohler also emphasized in conclusion that combination of good rolling practice and the equipment outlined above may develop extremely good results. On the other hand, poor rolling practice can cause more off-gage material than all electrical gadgets can possibly save. While modern electric devices as outlined can greatly assist in obtaining proper gage, they are not a cure all.

In a paper, "Power Requirements of Cold Strip Mills," A. F. Kenyon, steel mill engineer, industrial department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., detailed results of a survey made in co-operation with many steel mill engineers. This power data is expected to be valuable in aiding in obtaining better performance from existing mills and in guiding selection of equipment for new mills.

Tabulations were prepared listing most of the multistand tandem cold-reduction strip mills, now numbering more than 30. For each mill, the size of mill rolls and reel, ratings of mill and reel motors and main motor-generator set were listed as well as gear ratios, mill speeds, etc. While some of this information was previously available, the consolidation into tabular form makes it much more convenient to use.

Power calculations to determine probable loads imposed by rolling of a particular product at a specified speed and under certain conditions in the individual passes generally utilizes test data obtained from similar mills doing approximately the same work. To be universally applicable, such test data must be reduced to the basis of energy units per unit amount of rolling work and plotted in the form of curves from which may be read the values to apply to the particular conditions specified. The method of preparing the energy consumption curve from a typical set of test data was described in detail and a typical power calculation presented to show the use of data from the energy consumption curve in determining motor loads for another rolling schedule. Hundreds of tests were made on more than 20 different tandem and reversible cold reduction mills to obtain the energy-consumption curves included in the paper. This simplifies power calculations for the rolling of various classes of products.

It was most interesting to note that data from many mills showed quite close correlation of results, permitting preparation of composite curves.

In discussion following Mr. Kenyon's paper, R. H. Ellis, electrical engineer, United Engineering & Foundry Co., Pittsburgh, said their data checks closely with results outlined in Mr. Kenyon's paper. In fact, a reversible and a 5-stand tandem mill checked exactly. He also emphasized that definite data on entering and exit thickness was essential for proper layout of electrical requirements of new mills, these specifications necessarily being set up by the mechanical engineers prior to calculation of the electrical requirements.

Power Curves

L. A. Umansky, industrial department, General Electric Co., Schenectady, N. Y., suggested that power curves with entering thickness as the abscissae rather than elongation values might be preferable.

M. Stone, engineer, United Engineering & Foundry Co., Pittsburgh, inquired as to correlation between energy and tension and detailed some experiments made which showed that effect of back tension was to reduce energy consumption. Mr. Kenyon replied that back tension was recognized as a factor in reducing energy consumption, possibly due to reducing the

friction between the strip and the rolls.

L. R. Milburn, electrical engineer, Great Lakes Steel Corp., Ecorse, Mich., asked why it was not found out long ago that the second and third stands require less power than the first. In answering this question, Mr. Kenyon pointed out that changes in rolling practice probably are responsible for this as it is entirely possible to have the second or third stand take more power than the first. A factor here is the amount of power exerted by the reel pulling the strip from the stand. He emphasized that engineers now have a different conception of how to run cold mills than existed five years ago and that a heavy reduction now is made in the first and second stands with only a light draft in last stand instead of the opposite practice as was common five years ago.

Other discussion brought out the importance of strip tension between stands as an influencing factor on surface finish and the fact that possibly it should be held within certain limits on account of this effect. Lubricant also has an important effect on distribution of power consumed at the various stands. In one case a different lubricant changed heavy reduction and power consumption in the first stand with light reduction in the second and third to just the reverse.

Electric Industrial Trucks

In his paper, "Development in Electric Truck Transportation in Continuous Sheet and Strip Mill," C. B. Crockett, Industrial Truck Statistical association, Chicago, detailed the factors involved in use of electric industrial trucks in mechanical handling problems in the strip mill. Factors involved included such questions as what are size, weight and shape of the material handled, is unit uniform, is it necessary to position unit during transit or in loading or discharging, is there change in character of the material during transit, what is effect of future possible changes in layout of the plant, does the operator start from and deliver the material to the same place each time and is the operating rate uniform. Of course, there are many other factors involved which influence the problem and which must be considered.

He emphasized that, contrary to the usual belief, some backtracking does not always indicate inefficient handling. However, processes and equipment should be arranged so the end of one operation is near the beginning of the subsequent operation. This is possibly the most important essential of good layout. Thus a change in direction of travel is not necessarily inefficient handling.

Attention was called to the increased trend toward larger coils. Twenty-five thousand pound coils are now being employed in some plants and 50,000-pound coils for the near future were predicted. One reason for this is that the power required to move the coil does not increase as fast as the coil size. For instance, a 12,000-pound coil requires only 32 per cent more power than a 6000-pound coil. In addition, there of course are other factors such as increased output of the rolling equipment with more uniform gage, etc.

Truck Movements Analyzed

Place in the handling setup occupied by cranes, conveyors and power trucks was detailed and list of operations handled by each given. An interesting analysis of truck movements was presented showing average length of travel to be 150 to 200 feet with some few operations up to 400 feet. These details and flow charts were obtained by the author's visiting a large number of plants to determine their practice. Length of time in operation varied from 48 to 69 per cent. • Average distance traveled during an 8-hour turn varied from 27 to 41 miles.

It was emphasized that quite often equal tonnage can be handled faster when broken up into small units. This is done not necessarily at lower cost. It may be an aid in increasing production, however. Thus, two or three small trucks, being able to move faster on the floor, may be found advantageous in certain instances.

According to Mr. Crockett, there is a distinct trend to place handling costs in a separate account rather than to lump them in plant overhead as has been done widely. This focuses attention on handling costs and aids in reducing them.

In subsequent discussion, it was pointed out that maintenance may be a very large item with old trucks. For instance, in one plant the maintenance expense ran $1000 per year per truck. In another plant doing exactly the same amount of work with newer units the cost was only one-eighth this amount. Not only is old handling equipment expensive, but possibly its most important effect is on plant production which it seriously hampers in many instances, due to frequent breakdowns.

In the lubrication engineering session, F. J. Thomas, lubrication engineer, Republic Steel Corp., Cleveland, in "Modern Lubrication of Existing Equipment" pointed out the desirability of lubricating all equipment now in use in a modern and most efficient manner. Although age and poor design coupled with the cost to modernize are obstacles preventing efficient lubrication, the added returns from modern lubricating equipment more than pay for its installation.

An instance was cited where a $7000 investment in a new lubricating system reduced lubricating costs from 4.2 to 0.7 cents per ton of product. This plant has a 70,000-ton per month capacity. Even at 30,000 tons per month, 50 per cent operation, this 3½ cent per ton saving amounts to over $1000 per month, a most satisfactory return on the investment.

Mr. Thomas emphasized the importance of tuning up equipment before installing new lubricating systems, pointing out the necessity of fixing up bearings and checking alignment to see that equipment is as closely in line as possible. Clearances, and other factors entering into operation of equipment also should be checked.

In subsequent discussion, it was emphasized that a lubricant must be distributed properly inside a bearing for most efficient operation. Changes in equipment and bearing design often permit more efficient lubrication. For instance, a number of ingot cars were changed over from plain to roller bearings. This did away with excessive maintenance due to inability to lubricate properly the plain bearings. In addition to eliminating practically all maintenance and cutting grease costs the same engine now is able to pull one and one-half to two times as many cars as before.

Old Systems Can Be Modernized

Modern lubricating systems can be put on old systems in periods when they are shut down such as over weekends without disturbing production, according to R. M. Gordon, Gordon Lubricators division, Blaw-Knox Corp., Pittsburgh.

It was emphasized that due to present rush of business many old mills recently placed in operation probably will be overloaded considerably to get the tonnage output desired. Especially important is adequate lubrication of such equipment according to modern standards. One old mill increased its output 10 per cent and cut its energy consumption to 4 kilowatt hours per ton by modernizing its lubrication equipment.

In the paper, "Progress of Lubrication in Steel Mills," by C. C. Pecu, lubrication engineer, Bethlehem Steel Co., Lackawanna, N. Y., the history and development of lubrication engineering in steel plants were covered. In tracing progress from the early crude lubricating equipment to modern mills, the results of advanced engineering are evident

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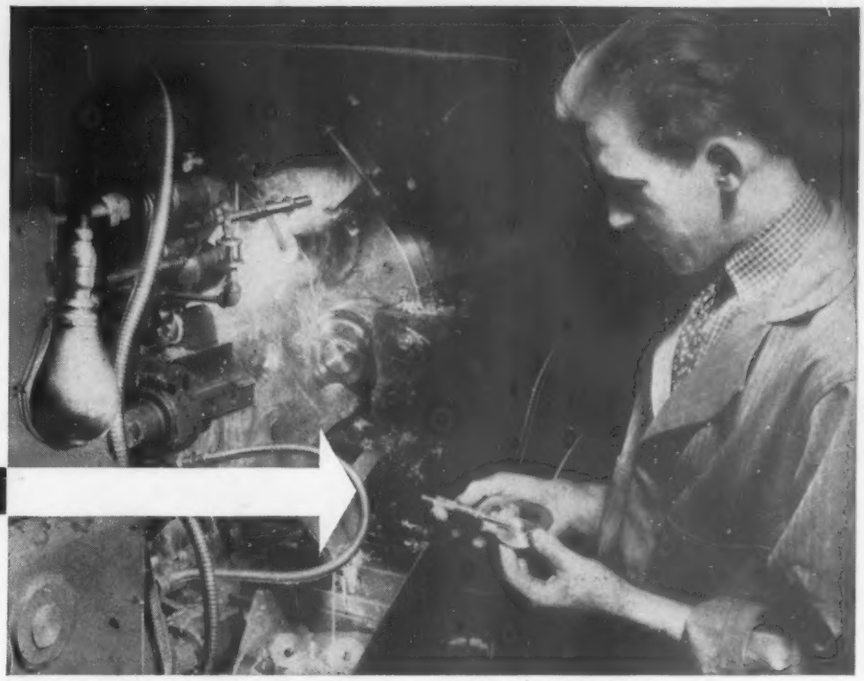
PRECISION HERE...



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Making Tin Pails

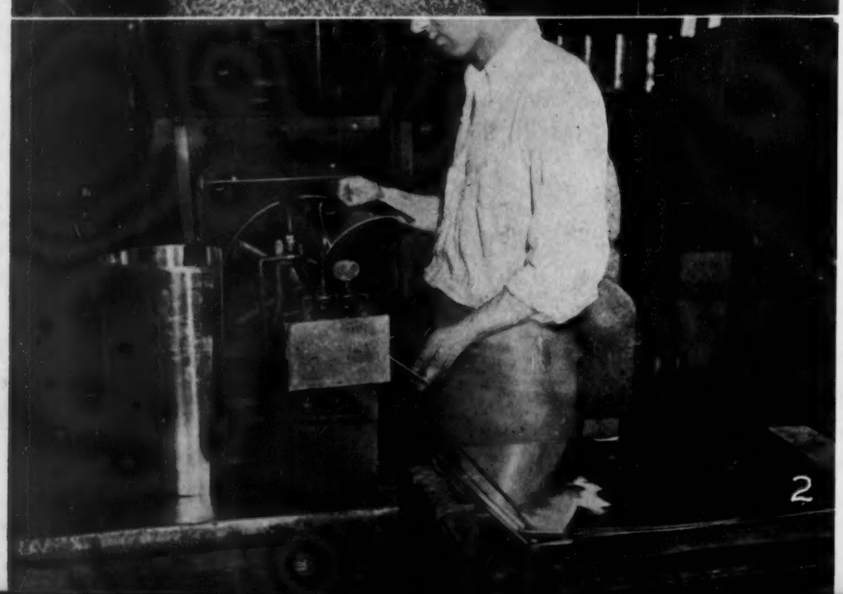
Fast series of operations in container manufacture are aided greatly by careful location of processing equipment in combination with belt and gravity conveyors which also stock parts at certain points

■ AT PLANT of Heekin Can Co., Sixth and New streets, Cincinnati, a portion of one floor is given over to the assembly of 50-pound lard pails. Steps in production of these pails are shown here. All equipment and operations shown are located around the walls of one room. Central area of this room is given over to storage of completed pails and raw stock from which the pails are made.

Handling, a most important part of the work, is here divided into about eleven operations or steps. Transferring the material from operation to operation, storing parts in process at certain points to eliminate breaks in production and carrying work to more than one operator in the series when a step requires longer time than other steps are all taken care of efficiently by an efficient arrangement of tables, roller conveyors and slide conveyors. Processing machines themselves are positioned to permit easy flow from one operation to the next. Since most of the operations involve approximately the same length of time, it is possible to perform them in sequence and only one operator and machine are required for each operation, except at one or two points indicated later.

First operation is shown in Fig. 1. Here two opposite edges of the sheet which forms the sides of the pails are turned over in preparation for making the side seam. Operator picks up a sheet from stack nearby, inserts it in machine, turns edge, removes and repeats the operation on the opposite edge. Then it is passed on to the next operator's position just to the rear of the machine in the foreground of Fig. 1.

Fig. 2 shows second operation



where the side sheets are passed through a set of small rolls to form them to the proper curvature. They are not given sufficient forming to completely close the circumference, but they are curved so that when the seaming operation subsequently takes place, there will be sufficient tension in the interlocking joint to hold the parts in position.

Fig. 3 shows operator closing the side seam. . First the curled edges are hooked together and placed over the mandrel of the press. Then operator trips the press which bumps the seam to close it securely. Note the latch at the extreme rear of the mandrel. As the operator inserts the piece, the overlapping edge is revolved against the end of this latch, automatically positioning the seam for correct closing.

Next operation is shown in Fig. 4. Operator, Fig. 3, places his finished pieces on a belt conveyor which carries them to the machine in Fig. 4. There is a dam across the belt conveyor at this point, permitting units to accumulate here. Operator in Fig. 3 is not served by a conveyor as he merely reaches over to a delivery table of rolls in Fig. 2 to obtain sheets.

Operator in Fig. 4 places pieces in a machine which rotates them rapidly under forming rolls starting the bead at top of pail rim and turning the bottom edge up in preparation for seaming on the bottom.

Next operator, Fig. 5, also is in line with the same belt conveyor which serves station 4. Operator 4 places his completed pieces back on the belt conveyor on the other side of the dam, permitting them to be carried to position 5. In Fig. 5 the operator rolls two beads in the sidewalls to stiffen the container. From the machine in Fig. 5, the operator places the container either on the same conveyor carrying it to the next operator or on a conveyor on the other side of him, which carries it to another point.

Fig. 6 shows curling operation where the top of the container is turned over completely to form the round, smooth edge required. Curling the top edge was started by operator 4 and is completed at station 6. Operator in Fig. 6 takes the containers from his left alongside the window, curls them and places the container on the roller conveyor section in the immediate foreground.

When drums are made, ends are placed at both top and bottom of the container. Then this curling operation is eliminated and operator 5 places the container shell on the roller section shown in front and to the extreme right in Fig. 6. Fig. 6 shows the hinged section of this conveyor turned back. When making drums, however, this hinged section is put in place to line up with the roller section at the extreme left

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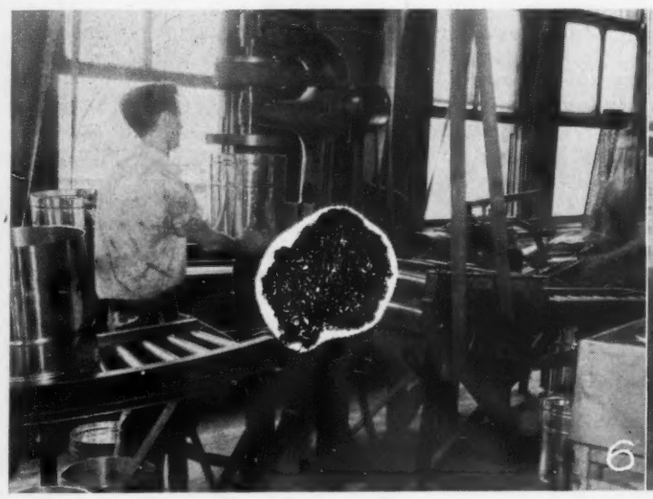

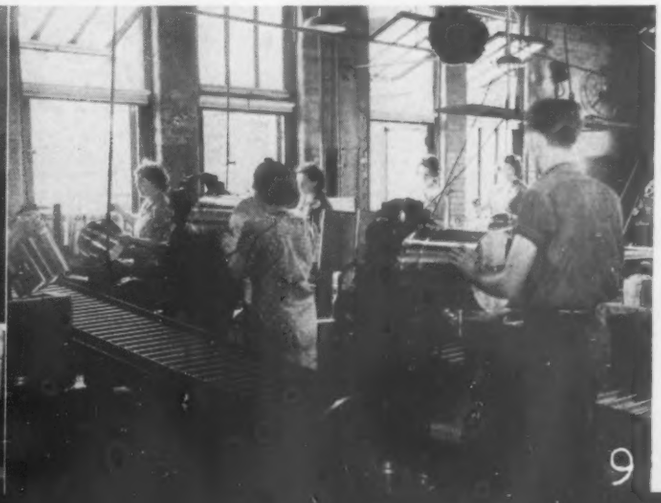

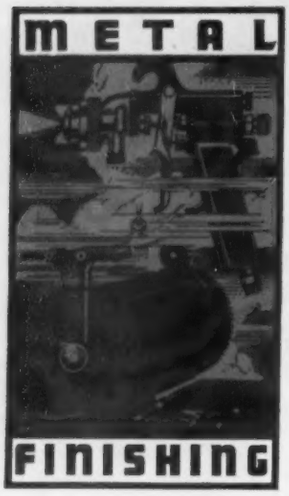

Cleaning Polished Steel

New method cleans completely in one operation, assures brighter, more lustrous deposits with better coverage. Eliminates pits and pores, improves corrosion resistance, reduces costs by eliminating wiping to remove smut

By J. S. BRADY
Oakite Research Laboratories
New York

■ DURING the past decade, manufacturers of cold rolled steel have so improved their technique of polishing that even the lowest priced grades are a vast improvement over the best grades supplied years ago. The steel is so well finished that no further polishing is needed insofar as the flat stock is concerned. However, during fabrication of this rolled sheet, the steel is subjected to working, drawing, spinning and stamping operations which often mar the original finish and which make refinishing necessary.

Repolishing may be done on a wheel, the surface of which is charged with a layer of glue and emery or other abrasive. The grade of abrasive used determines the finish put on the work. These wheels are lubricated with greases to prevent burning the work and to improve the finish imparted.

After being polished, the surface of the work is naturally covered with a soil consisting of the animal or mineral grease used as a lubricant, fine particles of abrasive from the wheel, fine metal particles and general dirt composed of burned grease from the wheel. During the polishing operation, the article may also acquire fingerprints and shop dirt. Typical examples of this soil are shown in Figs. 1a, 2a and 3a.

Thus it becomes essential to remove three distinct materials in the cleaning operation; namely, grease, abrasive particles and metal particles. Removal of the grease may be done in a variety of alkaline cleaners with or without electro cleaning. Grease also can be removed successfully by solvent or degreasing methods, but these methods often leave on the work a fine smut composed of burned insoluble grease as well as metal and abrasive particles.

To secure a bright, smooth, adherent electrodeposit free from pits and pores, it is essential that every trace of smut and solid matter as well as grease be completely removed from the polished surface.

Fig. 1a. Polished steel coated with burned grease and metallic particles

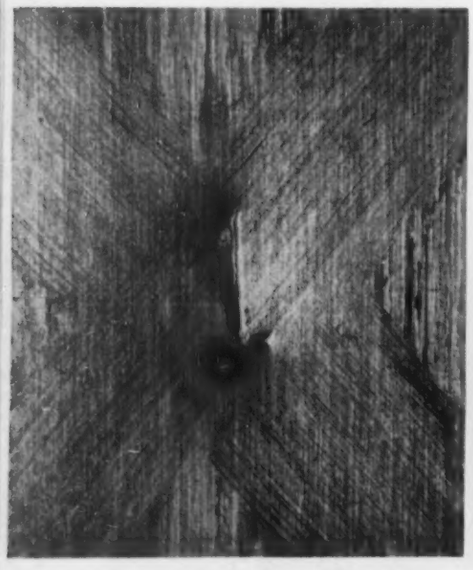

Fig. 1b. Same piece of polished steel after cleaning by new method

Smut Causes Pits and Pores

Heretofore, this complete smut removal could not be accomplished in alkaline still tanks, electro-cleaning solutions, degreasers or a combination of these. This may be seen in the photomicrographs Figs. 2b and 2c. In Fig. 2b, the soiled steel sample has been subjected to a degreasing operation, and although the grease is dissolved the solid matter is still visible on the surface. Fig. 2c illustrates the same sample after electro cleaning in an alkaline bath with the highest efficiency heretofore available, and subsequently nickel plated.

This illustrates the pits and pores caused by incomplete removal of solid matter. In actual plant practice, of course, wiping of the surface would have followed the alkaline cleaning operation. This would have removed the smut and made possible a good electroplate.

The increased use of bright electrodeposits on polished steel has created such a demand for a smut-removing cleaner to eliminate the need of wiping, that considerable research has been done on this phase of metal cleaning. As a result of this investigation, a cleaner has been developed which will under proper conditions, remove every trace of smut and grease from the surface of polished steel. This material eliminates the necessity for degreasers, presoaking tanks, emulsifying solvents and mechanical scrubbing or

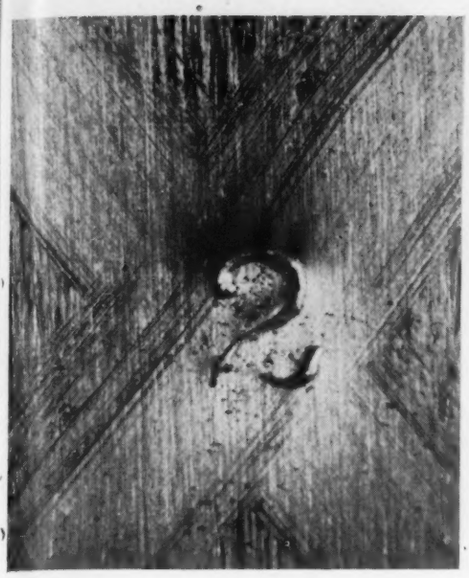

Fig. 2a. Polished steel soiled with grease, smut, abrasive and metallic particles. The X is drawn to show dirty surface condition

Fig. 2b. Same piece as in Fig. 2a but following solvent degreasing. Grease gone but practically all smut remains. X still visible

Fig. 2c. Same steel as in Figs. 2a, 2b but after direct-current electrocleaning and bright nickel plating. Smut still visible through plate

hand wiping. The compound, when used with high density reverse current, will completely remove smut and grease.

The use of reverse-current cleaning on steel has been practiced since the advent of electrocleaning but did not have its present popularity until recent years. One of the reasons for this is probably because twice the gas volume is generated on the work with direct current as with reverse current. This gas has, of course, a mechanical action in dislodging particles of dirt, and twice the gas volume provides twice the mechanical action.

There are, however, several distinct advantages in the use of reverse current in place of direct current in cleaning steel. First, when foreign materials such as finely divided lead, tin, zinc or copper particles and smut are introduced in the electro-cleaner, they invariably deposit on the work as a loosely adherent smut when direct current is used.

Secondly, soap, formed by saponification of tallow and vegetable oils, has a tendency to deposit on the work with the use of direct current. When introduced into an acid dip or acid plating solution, this is converted to fatty acids causing a cloudy deposit which results, in many cases, in peeling of the electrodeposit.

Third, the metallic particles and smut on the polished steel, having a positive charge, will tend to stick to the surface despite vigorous evolution of gas on the surface of the work when using direct current.

An illustration of the above is shown in Figs. 2a, 2b and 2c. These photographs show the smut and polishing compound on the work (2a), the removal of grease by solvent degreasing in the vapor phase (2b), and electrocleaning with direct current density of 50 amperes per square foot for 30 seconds (2c). after electrocleaning, the work was plated with bright nickel to show the smut condition still remaining on the work.

These photomicrographs illustrate the fallacy in trying to remove smut with a direct current cleaner even after degreasing.

Opposed to this is the advance in cleaning represented by the new cleaner and illustrated in Figs. 1a and 1b. Fig. 1a is a typical polished steel sample with smut and grease clearly visible. Fig. 1b shows the sample after being cleaned in the new cleaner with reverse current

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Fig. 3a. Sample of steel with particularly heavy accumulation of smut and grease

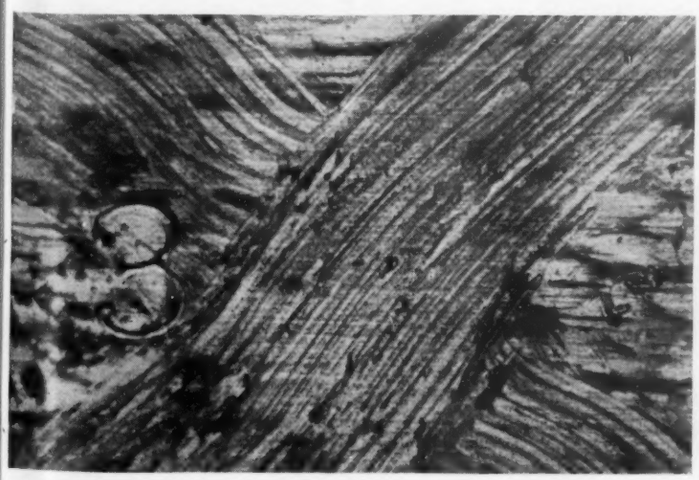
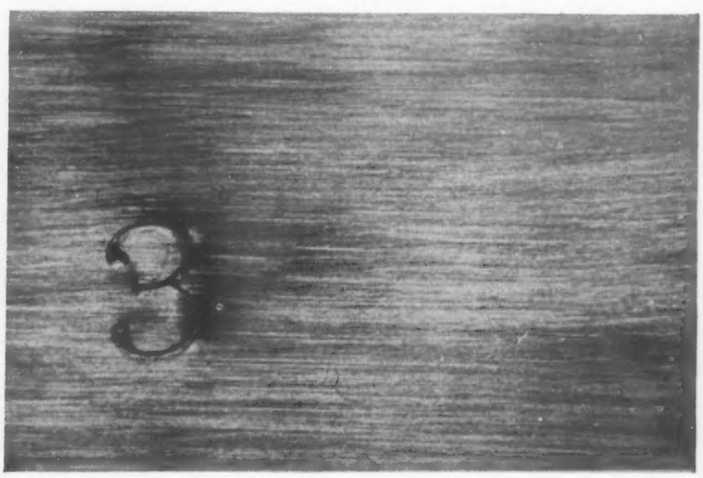
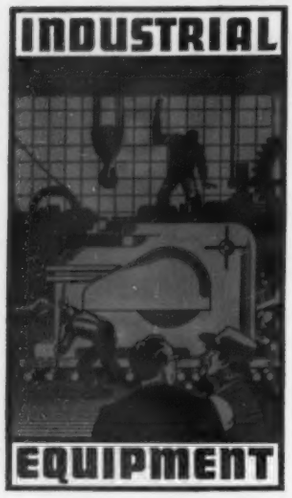


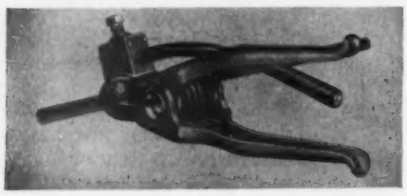
Fig. 3b. Same sample as Fig. 3a but cleaned by new method. Surface perfectly clean





Return-Circuit Clamp

■ Ohio Brass Co., Mansfield, O., has developed plier-type ground clamp for completing ground or return circuit connection on portable electrically-operated equipment. Clamp has pair of plier-type jaws operated by a heavy steel spring to grip rail bond cable. Jaws also may be attached to rail base itself. Negative or ground cable from portable machine is clamped in adjustable cable

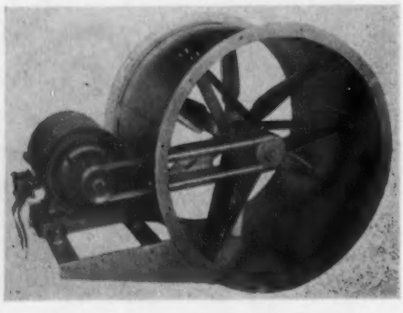


grip. Jaws and body of clamp are made of high-strength bronze. The ground clamp is designated as Type P.

Fan for Duct Systems

■ South Bend Air Products Inc., South Bend, Ind., announces a non-sparking fan primarily for use in duct systems, especially where explosive gases are to be handled. Furnished in both single and tandem fan types for static pressures up to 3 inches, the single fan type has a capacity from 1600 to 26,000 cubic feet per minute and the tandem fan type from 1600 to 30,000 cubic feet per minute.

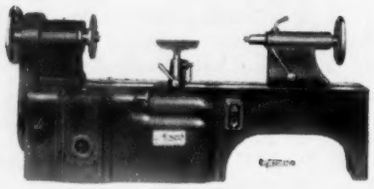
These fans are easily installed in any duct line without fitting other



than a flange on end of duct. Blades are drop forged aluminum alloy. Motor support is integral with fan unit. Belt is adjustable and all working parts are completely enclosed for protection. For use in handling acids, units coated with Heresite are available.

Wood-Turning Lathe

■ A new line of wood-turning lathes capable of an infinite number of speeds from any desired maximum down to zero is announced by American Saw Mill Machinery Co., Hackettstown, N. J. While available for several years on metal turning lathes, this is said to be the first practical application of this type of drive to wood turning lathes. The transmission and motor are mounted below the lathe bed and spindle is

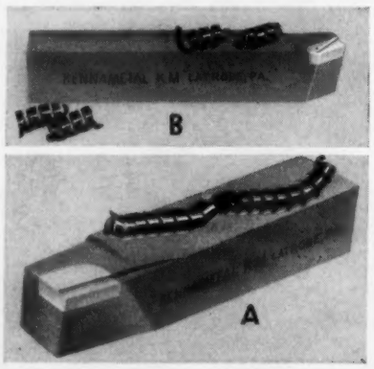


driven by a multiple V-belt drive from the transmission.

The standard spindle speed range is from 0 to 2400 revolutions per minute, but other ranges are available. Spindle speed, shown on a dial, is controlled by means of a knurled knob. All movable parts except face plate and live center are totally enclosed. These lathes are available in either floor or bench models.

New Tool Forms

■ McKenna Metals Co., Latrobe, Pa., announces two new forms of standard Kennametal single-point

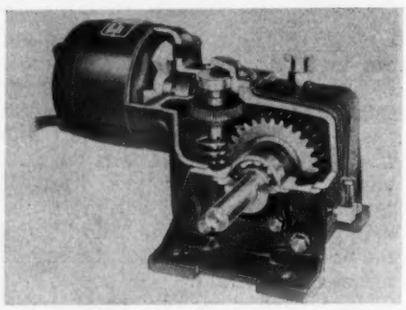


turning, facing, and boring tools with chip breakers. Steel either annealed, as forged, as cast or in the heat-treated form up to 550 brinell may be machined by these tools. Figure A shows the parallel chip breaker form, designated as a chip curler, on a standard Style No. 11 right hand turning tool. Figure B shows the chip breaker ground at an angle, usually 20 to 40 degrees from the side cutting edge, which breaks the chips even when of tough nickel steels by deflecting them against the unturned shoulder of the work, where they are snapped off into crescent shaped chips easily shoveled up. This is designated as a chip breaker form. It is recommended that chip breaker forms be reground in a fixture with diamond impregnated bakelite wheels or with special loose bond silicon-carbide grinding wheels.

Speed-Reducer Motor

■ Bodine Electric Co., 2254 West Ohio street, Chicago, announces a speed reducer motor developing from 1/50 to 1/20-horsepower, depending upon gear ratio, for very low speeds and high torques. Speeds as low as 0.6-revolution per minute and torques up to 350 inch-pounds are developed. Reduction ratios range from 72:1 to 2880:1. The oil-tight gear housing has ample heat dissipating area, is cast integral with the motor end-shield and has rabbetted end-shields that position the drive shaft. Motor diameter is about 4⅜ inches.

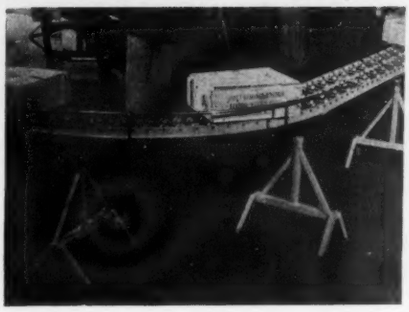
Worms are ground from hardened steel, primary gear is bakelite and



secondary gear hard bronze. Intermediate shaft bearings take end thrust in either direction so unit is reversible. In normal horizontal mountings, the primary worm is lubricated by an oiling gear and the secondary worm by the secondary gear, both of which dip into the oil. The standard motor mounts with rotor shaft horizontal, but vertical rotor mounting is available.

Gravity Wheel-Conveyor

■ Metzgar Co., Grand Rapids, Mich., has developed lightweight wheel conveyors of movable or fixed type which will carry loads up to 700 pounds and are adaptable to any requirement within their capacity. Welded construction of conveyor gives maximum strength and rigidity with weight of 6.6 pounds per foot. One man can easily handle a 10-foot section and assemble 50 feet of conveyor in 6 minutes. Straight lengths can be coupled at a 40-degree angle without using a curve section, and fixed standards can be



bolted to the floor where a permanent installation is desired.

The amount of inclination for gravity operation of conveyor is regulated by a thumb screw on the standards. Three feet of elevation will convey a 50-pound box 100 feet or more without any push. The heavier the case to be conveyed, the less elevation is necessary. Conveyors do not require lubrication. Wheel bearings are dust-proof and have hardened ball races.

Industrial Luminaire

■ Industrial concentrator lighting units for lighting horizontal and vertical surfaces from an oblique angle are announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This type of supplemental lighting is useful for fine assembly work, inspection, spray booths, exact machine work or for paint shops. The complete unit consists of aluminum reflector, porcelain socket assembly, cast-aluminum socket housing and aluminum swivel-mounting bracket for ½-inch conduit mounting. It employs a one-piece reflector with diffuse or specular reflecting surface treated by the Alzak process for a highly efficient, easily cleaned finish. Heat-resisting glass lenses, either plain or heavy stippled, are supplied and are held to reflector by a split lens-holding ring with self-spreading lug to facilitate lens removal. The spreading screw is soldered to the lug and a rubber gasket between the reflector and lens gives a vapor-proof and dust-tight seal. This luminaire is furnished in two sizes using respectively a 200-watt clear or inside frosted bulb, or a 300 or 500-watt clear lamp.

Oil Applicator

■ J. A. Honegger and associates, Bloomfield, N. J., has developed a "vest pocket" stylographic oil applicator which delivers small measured amounts of oil to any surface, by applying the stylographic point to that surface and pushing on applicator. One drop of oil is delivered at each stroke. Applicator is nickel plated and may be used for oiling adding machines, small motors, casters, doors, etc. Purchaser's name can be stamped on applicator housing if desired, at slight additional cost.

Centerless Grinder

■ Centerless grinding machines manufactured by A. B. Malcus Holmquist, Halmstad, Sweden, are announced for sale in the United States by American representatives of that firm, Triplex Machine Tool Corp., 125 Barclay street, New York.

Machines have grinding and regulating wheels with bearings on both sides and are adjustable on slides against work support. The grinding spindle has a plain bearing

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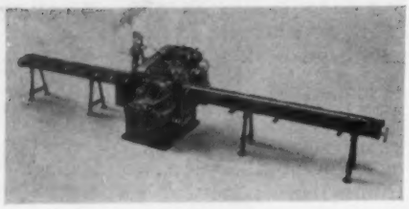
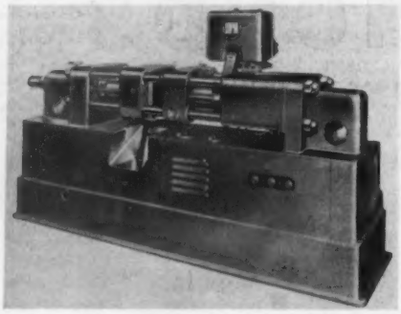


with efficient circulation lubrication by oil film less than 0.0004-inch thick. Direct electric drive and regulating of feed wheel ensure rapid and efficient control of the grinding. Grinding and regulating wheels are dressed automatically from rules.

Small sizes of hot rolled material, 1/16 to 5/16-inch for instance, are completely ground in a single passage of the machine. Thus the through-feed speed at daily running will be from 12 to 20 feet a minute, when calculating with a stock removal of 0.01 to 0.02-inch on the diameter and with a tolerance that fully answers all requirements.

Injection Molding Press

■ Hydraulic Press Mfg. Co., Mount Gilead, O., has put on the market model 40-H-2 self-contained injection molding press of horizontal clamp type. Two separate units are consolidated into one press, the injection unit and the clamp unit, each having its own operating valves and controls. The injection unit consists of a nozzle with material chamber, automatic feed and hopper and incorporates the means of plasticizing

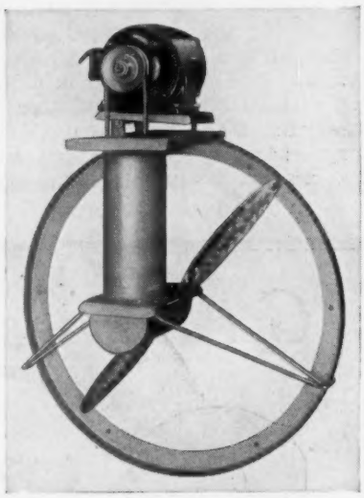


the material. The clamp unit is a rapid acting horizontal press.

Both manual and automatic controls are provided. The manual control consists of pushbuttons for "start" and "stop" of motor; heat "on" and "off;" feed "on" and "off." Closing of clamp, injection stroke and opening of clamp are controlled by hand levers which operate the main operating valves. A complete range of capacities of this press is available including 2, 4, 5, 7, 9, 12, 18 and 36 ounces.

Fan with Motor Out of Airstream

■ A propeller-type fan with motor entirely outside of the airstream announced by Hartzell Propeller Fan Co., Piqua, O., is designed for spray booth work and other installations where location of the motor in the airstream is undesirable because of the presence of inflammable fumes, extreme heat or abrasive or corrosive elements. Base on which the motor rests is welded to ring be-



hind blades and also to shaped belt shield.

The platform to which motor is bolted is hinged to the base, and belt tension can be adjusted by raising or lowering the side opposite this hinge by turning a single bolt. The standard Hartzell "Tear-Drop" propeller, which operates quietly and holds air delivery well against back pressure, is used. This fan is built in standard sizes from 17 to 28-inch propeller diameter.

Fire Observation Port

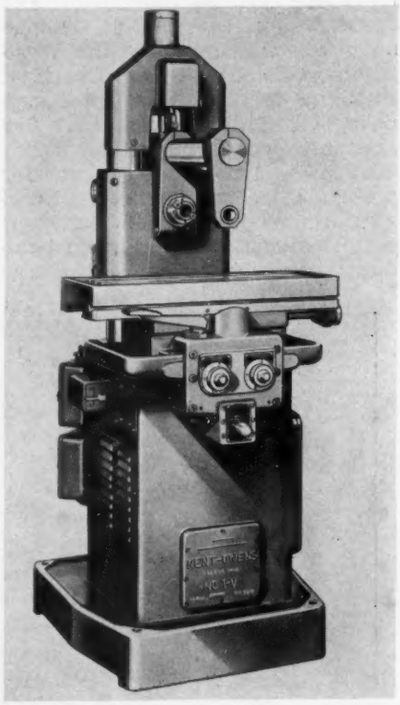
■ Detroit Stoker Co., General Motors building, Detroit, has developed an observation port to permit inspection of fire and fuel bed. Port is 6 inches wide x 4½ inches high and gives a liberal view of interior without admitting cold air to furnace. Port is covered on outside by colored pyrex glass and on in-

side by a shutter, with all infiltration of air eliminated. When shutter is raised, port is opened and colored glass on outside diffuses the glare. When the handle is released, cover entirely closes the port. The pyrex glass is protected by a monel metal screen when the shutter opens. Manufacturer recommends two or more fire observers for each furnace.

Vertical Milling Machine

■ Kent-Owens Machine Co., Toledo, O., announces No. 1-V milling machine, combining horizontal spindle with an automatic hydraulic vertical head feed for milling Woodruff keyways, cutting-off operations and milling tongues and slots in the ends of shafts.

The head movement is actuated hydraulically by a separate motor-driven pump mounted in the base. The head has vertical feed in the down direction only and rapid travel in both the up and down direction. Any feed from 1 to 80 inches per minute can be obtained. Head is mounted on two ground cylindrical steel posts with the head actuating cylinder and piston assembly above them and is counterbalanced so it

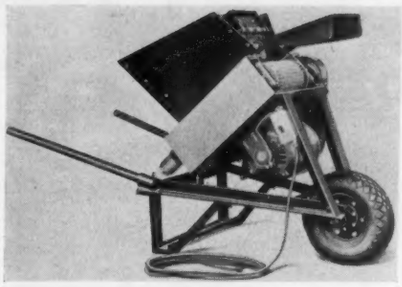


will not settle to the lower position when the machine is idle.

The table is 9 inches wide by 25 inches long and has three T-slots. It is adjusted lengthwise by means of a screw and micrometer dial for properly positioning the work under the cutters. A cross adjustment of 2½ inches is obtained by means of a quill with micrometer dial adjustment.

Sand Conditioner

■ Royer Foundry & Machine Co., Kingston, Pa., announces ten new



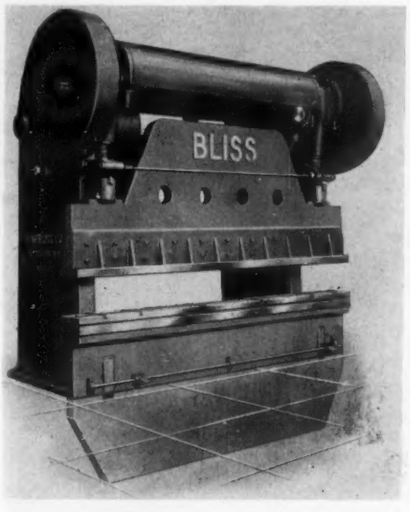
sand conditioner models for preparing backing, facing and core sand. Redesign has brought about savings in weight from 100 to 200 pounds per machine and reduced shoveling height on portable models 2 to 7½ inches.

A new portable model, the Royer Jr., weighing 270 pounds is mounted on a single pneumatic tire and has a capacity of 150 to 250 pounds of sand per minute and is for use in bays or on floors for removing sand contamination, breaking lumps and clay balls, blending and mixing old and new sand, distributing moisture through the heap, increasing permeability and aerating and cooling the sand.

All-Steel Press Brake

■ E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y., announces a press brake having a capacity of ½-inch by 12-foot mild steel. Operation is controlled through a hydraulic clutch with push button control for inching and stopping at any point of the stroke. Slide, 14 inches wide and having an 8-inch stroke is equipped with a ram shoe for large area dies, which may be removed when standard narrow bending and forming work is to be performed.

A reversible motor adjusts the slide over a distance of 8 inches and an overload protection feature stops the machine if it should be subjected to an unusually heavy load that might damage it. Distance back from center of slide to housings and from bed to slide, stroke down and adjustment up, is 14 inches. Height from floor to top of bed is 32 inches.



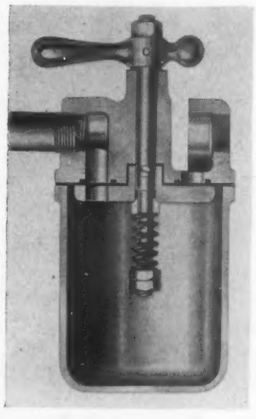
Goggle Pad

■ A sponge rubber pad which snaps over eye cups of Cesco chipping and welding type goggles has been developed by Chicago Eye Shield Co., 2300 Warren boulevard, Chicago, to

protect face of wearer from heat conducted by goggles during industrial operations such as preheating, metal pouring, relining open hearths and heavy gas welding. The elasticity of the rubber holds the pad in place without cementing or sewing. Pads can be sterilized and are readily replaced .

Condensate Trap

■ Pacific Flush-Tank Co., 4241 Ravenswood avenue, Chicago, has developed a positively sealed moist-

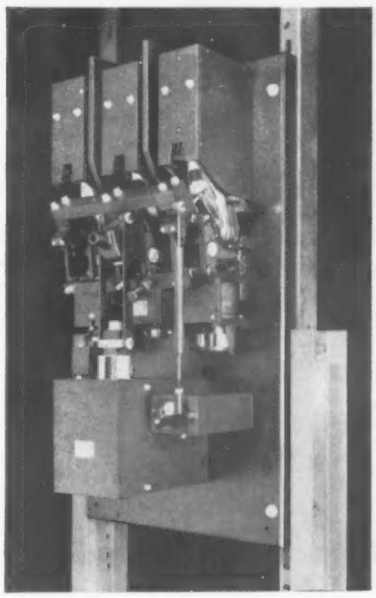


ure trap for removing small quantities of moisture from gas lines without hazards of gas leakage. When moisture from sewage treatment gas line drains into trap placed at lowest point in line, it may be drained off periodically by manually turning operating handle a half turn. In draining, gas line connection is closed before drain is opened, thus preventing gas leakage. After drainage, operating handle is turned another half turn to cut into gas line again.

Air Circuit-Breaker

■ Approximately one-half the size of previous devices of the same rating is a new air circuit breaker featuring a De-ion arc chamber announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The breaker operates on any current within the range of established interrupting ratings, and arcing current is limited to ½-cycle. which minimizes the noise and flash accompanying the interruption of a short circuit.

Heavy current through the flexible conductors to contact supports causes a magnetic reaction that increases contact pressure and gives increased protection to the main contacts. Five sizes are available,



covering a range of operating currents from 15 to 6000 amperes at 600 volts on alternating-current service, 15 to 10,000 amperes direct current and having interrupting capacities of from 40,000 to 80,000 amperes.

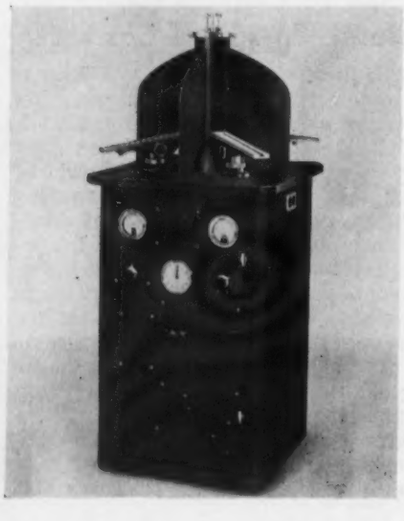
Coolant Pump Has No Metal-To-Metal Contact

■ Ruthman Machinery Co., 536 East Front street, Cincinnati, has developed a new coolant pump, Model 11023-E with no metal-to-metal contacts, which can handle nonlubricating and abrasive-carrying liquids. Pump, operated in a vertical position, is driven by a built-in ½-horsepower motor and is arranged for flange mounting against a pad on the side of the machine coolant reservoir. It will supply soluble coolant for machining operations in quantities up to 65 gallons per minute, and 85 gallons per minute with a ¾-horsepower driving motor. Pump inlet, 3 x 5½ inches, opens directly into the reservoir and

provides an unrestricted gravity flow. Pump discharges through an outlet in the center of this intake opening, making it possible to make connection internally and confining the piping or delivery passages to the inside of the machine housing. Throttling does not overload the motor but merely results in an internal agitation exerting an outward pressure through the intakes which serves automatically to clean out the main intake chamber.

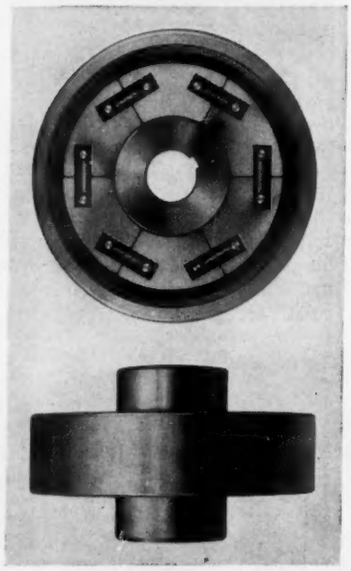
X-ray Machine

■ General Electric X-ray Corp., 2012 West Jackson boulevard, Chicago, offers its Model XRD X-ray machine for application of X-ray diffraction methods to industrial and research problems. This machine is claimed to satisfy the most rigorous specifications for precision research and control without sacrificing the requirements for safety, convenience, simplicity, compactness, etc. Labor involved in mounting specimens, registering diffraction patterns and operating the apparatus has largely been eliminated. Built to provide long, reliable, economical service, the machine has rubber-tired casters and an electric clock for timing exposures.



Centrifugal Clutch

■ A new positive-acting, automatic centrifugal clutch for all industrial power drives has been developed by Dawes Equipment Inc. 2280 Penobscot building, Detroit, having no metal-to-metal wearing surfaces and requiring no lubrication. The clutch is also suited for power drives where starting loads are heavy, and for internal combustion engines with low torque at slow speeds. Clutch consists of housing drum, or driven member, and expansion body, or driving member and steel cover-plate held in position by means of a lock ring which seals the clutch mechanism against dust. The expansion

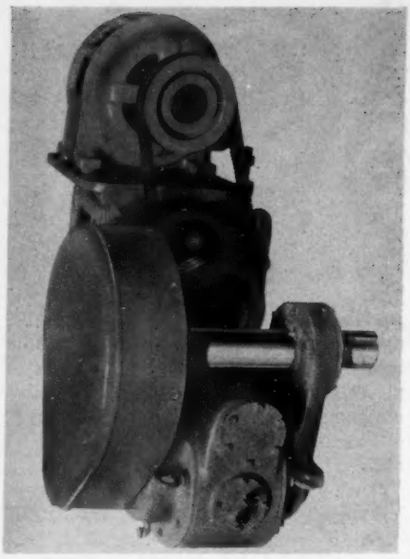


body is made up of six metal segments interconnected by tension springs and operating on individual posts extending radially from the driving hub. Clutch has a "free wheeling" effect which cushions shocks and consequently reduces starting demand loads. When at rest, the clutch is disengaged. Clutch can be built to engage smoothly at any desired speed and for any horsepower.

Variable-Speed Drive

■ A variable-speed drive unit with capacities up to 80,000 foot-pounds torque and infinitely variable speed from 310 revolutions per minute forward to nine revolutions per minute reverse is announced by Mechanical Handling Systems, Inc., 4700 Nancy avenue, Detroit.

The new drive permits the use of any desired constant speed motor of from 1 to 10 horsepower and is available for right or lefthand installation with vertical or horizontal

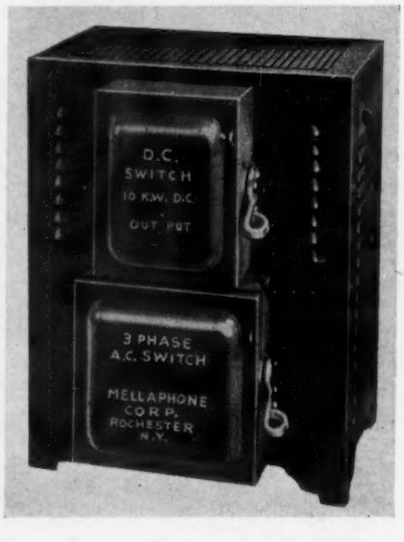


output shafts. Measuring 1 x 2½ x 3 feet, drive has drilled and tapped holes to accommodate either hold-down or hangar bolts.

Electronic Rectifier

■ A rectifier which will convert 3-phase alternating current into direct current has been developed by Mellaphone Corp., Rochester, N. Y., especially for use with variable speed direct-current motors on grinders and lathes. This rectifier operates from a 3-phase 220-volt alternating-current line and has an output of 10 kilowatts at 230 volts direct current. Taps are provided for line voltage adjustments from 210 to 230 volts. The voltage remains practically constant regardless of the load and has very little ripple.

There are no moving parts to wear out or require maintenance and tubes have a guaranteed life of 2000 hours under full load. No starting boxes, rheostats or panel boards are necessary. Provision can be made for dynamic braking when required.



Mill Developments

(*Concluded from Page* 58)

in added efficiency and economy with longer life and lower maintenance.

Appended to this paper was a complete list of lubricant applications in steel plants, giving the type and characteristics of the lubricant for each application to serve as a guide in the selection of lubricants.

J. H. Jones, metallurgist, Republic Steel Corp., Massillon, O., pointed out ways and means to improve life of steel mill gears in his paper, "Cause of Gear Wear and Failure." Numerous cases were given showing that greater precision in manufacturing and slight modification of tooth form with more attention to heat treating of gear blanks and finished gears resulted in quite gratifying results in terms of gear life.

Gear Tooth Wear

Subject of gear tooth wear and failure was divided into five different types of tooth destruction. These were: Abrasion and common wear, pitting, scoring, surface flow and tooth breakage. The common causes and remedy for each were presented. Without touching on general gear design or items that would greatly affect cost of manufacture, a number of ways to obtain increased life from current gear designs were detailed.

•

Chemistry Handbook in Third Edition, Revised

■ *Handbook of Chemistry*, by N. A. Lange; fabricoid, 1850 pages, 5⅝ x 7¾ inches; published by Handbook Publishers Inc., Sandusky, O.; supplied by STEEL, Cleveland, for $6.

This volume, in the third edition, has been revised and enlarged from the previous edition published in 1937. Changes in atomic weights necessitated revision of all tables dependent thereon. None of the tables in the previous edition has been eliminated although a number have been rewritten entirely or extended to incorporate more recent information.

An important change in this edition is inclusion of new material intended to make the whole work self-explanatory. This includes an extension of the section on definitions to embrace a definition of all column headings and technical terms throughout the handbook, with addition of a table of the commonly accepted thermal and physical-chemical symbols and a table of dimensional formulas.

New tables include physical and chemical properties of cast metals, reduction of barometer readings to sea level, symbols of thermal and physical-chemical quantities, dimensional formulas, properties of various photographic film emulsions and comparative photographic emulsion speed ratings. The volume contains a wide and varied type of information not always available to the chemist or metallurgist or those in allied lines.

Station-Type Machines Speed Up Repetitive Work

(*Concluded from Page* 41)

and unload at one convenient position, this machine will handle 400 pistons per hour.

Another machine which might not be thought of as station-type, but which nevertheless essentially is, is the Cincinnati double ram broaching machine depicted in Fig. 2. Two things can be accomplished by a machine of this type—which really is two machines in one. With two separate setups, one operator can handle efficiently two operations on one piece—passing it from one position to the other between alternate strokes of the ram; or with identical setups on each ram, he can be loading one piece while the other is being broached. In either case a lot of nonproductive time and wasted motions are eliminated.

In the setup shown, Studebaker connecting rod caps are being "broached off" connecting rods at the rate of 360 per hour, this being an interesting departure from the conventional method of sawing them off.

One principle of successful mass production is this: "When you have hold of a piece, don't let go of it until you have accomplished every possible operation." That is the theory back of the unique station-to-station accomplishment illustrated in Fig. 4. This consists in grasping the part as it is cut from the bar in one of the new Cleveland single spindle automatics; indexing it around in the tool turret to a position in line with a drill in a second operation unit mounted on the headstock; and then feeding it out against a revolving drill which makes a hole in the cut-off end of the piece while the first primary operations on another part are going on on the main spindle. Station-to-station technique in this instance eliminates the use of a secondary machine without detracting in any way from the production time of the automatic.

Rubber Coat on Steel Cylinder Ground To Size

■ **For use in the pickling bath division of a large Eastern steel company this large steel cylinder, covered all over with a 1-inch layer of rubber, is being ground to size in the plant of Hewitt Rubber Corp., 245 Kensington avenue, Buffalo. The finished cylinder is 77 inches long and 24 inches in diameter. Two and one-half days are required for the grinding operation which is done with 0.005-inch feed**

Bureau of Mines Minerals Yearbook

■ The 1939 Minerals Yearbook, published by United States department of the interior, bureau of mines, presents an economic review and statistical summary of the mineral industry of the United States in 1938. It reviews current trends in production, consumption, prices, stocks, technologic progress, world conditions and international trade for nearly one hundred metal and mineral commodities. It includes a survey of the bituminous coal industry, furnished by the national bituminous coal commission.

In response to the wide public interest in the problem of providing adequate supplies of minerals needed for national defense, the new Yearbook summarizes the domestic situation with respect to the more important strategic minerals that must be obtained in whole or in part from foreign sources. The record of nonferrous metal production is presented in authentic detail with final statistics for 1938 for every state. A new chapter presents a comprehensive survey of the consumption of pig iron and iron and steel scrap, extending a service begun in 1935. This volume also includes, for the first time, statistics for the sales of barite, by consuming industries, and a survey of kerosene consumption.

The book sells for $2 in the United States, Canada and Mexico ($2.50 in other countries) and may be obtained from superintendent of documents, government printing office, Washington.

Protects Edges of Sand-Paper Roll in Shipping

■ To protect ends of sandpaper from injury when dropped during freight handling, Behr-Manning Corp., Troy, N. Y., has devised and patented a resilient end pad for this service. The pad is made from corrugated paper wound to the same diameter as the sandpaper roll, sprayed with an adhesive and then sawed into disks of the proper thickness for the weight of the roll.

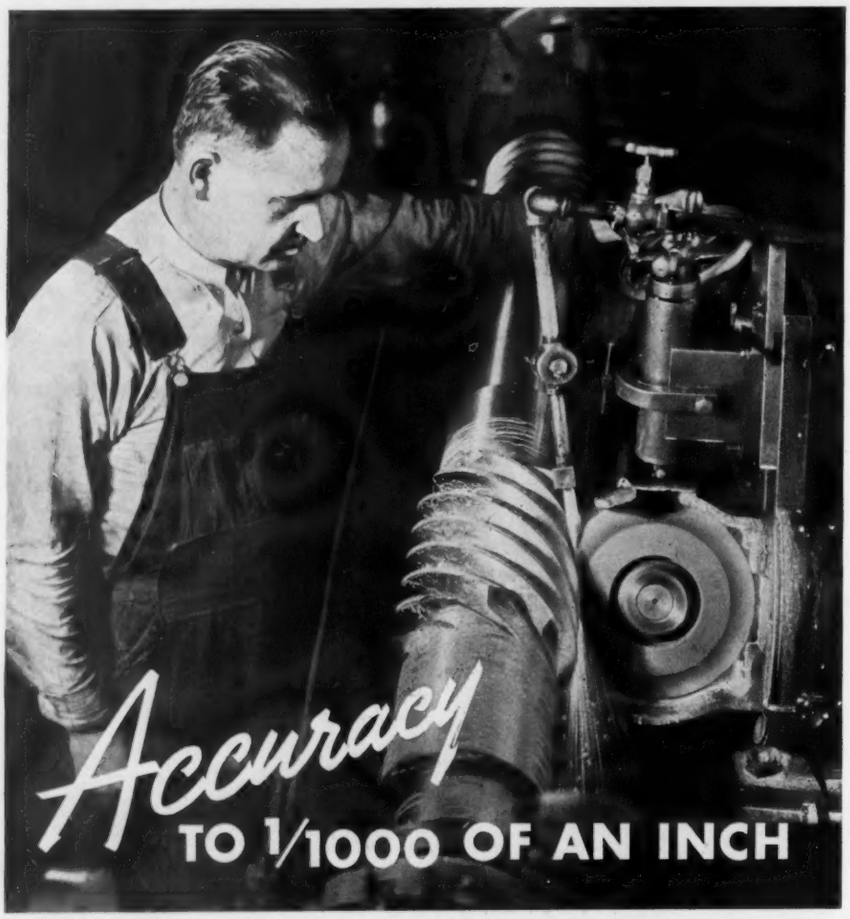
The disk not only has to be compressible in order to absorb the shock of the roll when dropped, but it also must be strong enough to protect the edges of the roll from crushing. Pads one inch thick have proven of sufficient thickness to protect a 35-pound roll. On heavier rolls weighing up to 150 pounds, 1½-inch pads are used. In use the pads have withstood as many as eight freight handlings in one shipping.

Hammered-Effect Finish Has A Smooth Surface

■ A marproof hammered-effect finish, "Polymeroid", for use on rough or porous metals has been developed by Ault & Wiborg Corp., 75 Varick street, New York. While it has the appearance of a rough surface, the finish actually is smooth and does not hold dust.

Although two operations are involved in its application, Polymeroid is essentially a one-coat finish. The first coat is applied with a spray gun; another coat, usually nothing but solvent, is sprayed on while first coat is still wet. Uniformity of this hammered pattern can be closely controlled. The new finish is said to cover defects in the metal, such as spot-weld marks and file scratches.

Polymeroid is made with a polymerin base and hence retains the characteristics of heat resistance, durability and adhesion which polymerin provides. Like polymerin, it may be baked on a short schedule. It is available in all colors and can be furnished with a high gloss.



★ Grinding worms after case hardening, to correct distortion . . . generating gears by a cutter that is an exact duplicate of the mating worm . . . accuracy in pitch diameter, lead and indexing . . . are PRECISION PLUS features of H & S Worms and Worm Gears. Precision inspection gives further assurance that these are the finest worms and worm gears it is possible to make.

Send note on Company Letterhead for NEW Catalog 39

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

Cleaning Polished Steel

(*Concluded from Page 63*)

and then plated with bright nickel. The material was used at a concentration of 8 ounces per gallon; temperature of 200 degrees Fahr.; current density of 40 amperes per square foot; time 30 seconds. No wiping or brushing operation followed the cleaner, nor was any preliminary cleaning given. Every trace of smut and grease was removed. The nickel deposit was bright, adherent and free from pits and pores.

Fig. 3a shows extremely dirty condition with a heavy accumulation of smut and grease. Fig. 3b shows this same sample after being electrocleaned in the new cleaner with reverse current. This particular sample was not plated. Surface is completely free from smut and grease, and is bright and clean.

Although this article describes an electrocleaning process for removing polishing compounds from steel, the solution is equally efficient in removing all types of oil and dirt accumulated on steel in manufacturing operations previous to electrodeposition.

The following advantages have been observed in the electroplated article due to complete removal of soil: Brighter and more lustrous deposits, better plating coverage of articles of intricate shape, utilization of all the throwing power in a plating bath, eliminated pits and pores, and improved corrosion resistance.

Speed of the cleaning cycle is increased since presoaking tanks, degreasers, etc. are unnecessary. Elimination of mechanical and hand wiping permits greater economies in manufacture.

♦

Ventilating Explosion-Proof Mining Controls

■ A scheme for ventilating the enclosed interiors of explosion-proof mining controls to drive off injurious acids formed from gases resulting from arcing has been developed by Westinghouse Electric & Mfg. Co., Pittsburgh. On ordinary open or partially ventilated controls the natural ventilation is adequate to carry away the arc-formed nitrogen before it can combine with oxygen and later with moisture to form the destructive acids, but with explosion-proof mining controls the formation of nitrous and nitric acids causes an annoying maintenance problem.

Although ventilation of the control chamber is essential to rid it of the acid-forming gases, ventilation in the normal sense cannot be tolerated because of the risk in explosive atmospheres. The new ventilating scheme employs a small motor of the vacuum-cleaner variety driving a fan that pushes a small volume of air through the control and through a series of labyrinths so proportioned that the gases resulting from any explosion inside are cooled to harmless temperatures before leaving the control compartments.

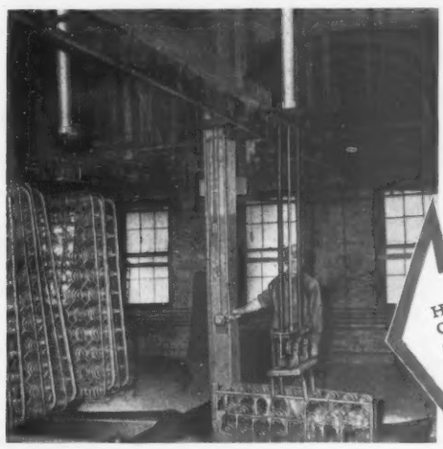
Completely enclosed control has been known to destroy itself in a few months, whereas the new control after two months of intentionally severe service showed no trace of nitrous oxide.

Progress of Tin Research

■ The third general report of the International Tin Research and Development council is a pamphlet containing a summary of progress made on all phases of the council's activities in 1938, including researches on tinplate, canning, hot-tinning, electrodeposition of tin and tin alloys, properties of tin and tin-base alloys, solders, bearing metals, pewter, bronzes and chemical compounds of tin. Copies of the report are available from the International Tin Research and Development council, Fraser road, Greenford, Middlesex, England.

75% Time Saving

WITH CURTIS AIR HOISTS



Eighteen months ago the Harris-Hub Bed and Spring Company installed four Curtis Air Hoists to replace hand-operated windlasses for dipping bed springs in paint baths. The result was a 75% saving in time. Not a cent has been spent to date for repairs, although the hoist illustrated is used about 250 times a day. Curtis Air Hoists were chosen because of their low cost, rugged simplicity and smooth operation.

Your plant probably has one or more jobs which can be done more efficiently and at less expense with Curtis Air Hoists. First cost is little more than a chain block. Installation is easy, and regular shop air lines are used. Curtis Air Hoists are immune to injury from overloads or bad atmospheric conditions, power consumption is small and maintenance negligible. They can be operated with ease and accuracy by unskilled labor. Capacities from ¼ to 10 tons.

Check your plant to see where you can save money with Air Power. Send coupon below for our booklet, "How Air is Being Used in Your Industry."

CURTIS Compressors • Air & Hydraulic Cylinders Air Hoists • I-Beam Cranes & Trolleys

CURTIS PNEUMATIC MACHINERY CO., 1996 Kienlen Ave., St. Louis, Mo.
Gentlemen: Please send me your booklet, "How Air is Being Used in Your Industry," and further information on Curtis Air Hoists.

Name _____ Street _____
Firm _____ State _____
City _____

Making Tin Pails

(*Concluded from Page* 61)

in Fig. 6, thus permitting work to be by-passed around the curling machine.

The conveyor at extreme left in Fig. 6 also may be seen in Fig. 7 at the extreme right. It delivers to the loading side of the seaming machine, Fig. 7. On the side opposite that seen in Fig. 7, an operator places a container on the table surface, positions a container bottom over the inverted shell and passes it on to the operator shown manipulating the seaming machine in Fig. 7 which rolls the bottom onto the container. Operator places the finished work on a short section of belt conveyor at his right which carries it to the belt conveyor shown in Fig. 8.

Along this belt, Fig. 8, are four soldering stations where side and bottom seams are made watertight. These stations are served by two belt conveyors, the belt near the windows carrying containers to be soldered. When seams are completed, the container is placed on the belt in the foreground of Fig. 8 which carries it to the next operation. Since a certain amount of time is involved in soldering these seams, four operators are required.

Delivery end of conveyor in Fig. 8 discharges onto short section of roller conveyor shown at left in Fig. 9. To assure a good seam in soldering, joint is first fluxed with acid, then soldered and delivered to the conveyor section in Fig. 9. Here operator at extreme left cleans off any acid flux remaining. Container then passes to riveting stations, two of which are shown in Fig. 9, one at the right and one in the center. In the extreme background of Fig. 9 are the four soldering operators.

Riveting on the handles completes assembly of the pails. Now they are stacked, ready for shipment. During the manufacturing operations, they have traversed a portion of one end of the room, traveled down the side of the room, across the opposite end and partway back up the opposite side. Arrangement of machines, conveyors and various operations is result of experience gathered over a considerable length of time during which these pails have been manufactured. Speed of the operations is remarkable. Average output of this line is 4500 50-pound lard pails daily and as high as 5500 have been turned out in an 8-hour shift.

Of course, the machines and operations described here are utilized for similar containers in addition to the 50-pound lard pails pictured. Other containers of varying size and style also are made on this same equipment as are drums with both ends closed.

3½-Inch Cables Support Dredge Bucket Ladder

■ **Four cables 36 feet long and two 25 feet long, 3½ inches in diameter, were made from 6 x 37 construction wire rope weighing 19 pounds per foot by Broderick & Bascom Rope Co., 4203 North Union boulevard, St. Louis, for a gold dredge of the Blue River Co., operating near Breckenridge, Colo. The bucket ladder of the dredge weighing 330,000 pounds now is supported by these six cables instead of by iron bars which had suffered deformation from boulders that fell into the ladder as dredge advanced into the diggings. The 36-foot cables extend from the equal-**

Because of their shock absorbing qualities, the six 3½-inch diameter wire cables supporting the bucket ladder of this gold dredge replace iron bars which had been deformed by falling boulders

izer at the block and tackle to the front end of the bucket ladder and the 25-foot cables go from the equalizer to the center of the ladder. For attaching ropes, closed sockets weighing nearly 300 pounds each were used at the ends of the ropes with about 100 pounds of zinc poured into each socket. The lower ends of all ropes are sheathed with split pipe as a safeguard against the sharp edges of falling boulders.

♦

Wrought Iron Pipe Dimension Standards

■ American Standards association, 29 West Thirty-ninth street, New York, announces approval of a new standard for dimensions and materials of wrought iron and wrought steel pipe and tubing.

The new standard consists of ten weight and thickness schedules running from the lightest to the heaviest pipe commonly used. Tabular wall thicknesses have been worked out by a basic formula which should not, however, be confused with design formulas such as those used in the ASME boiler code and the American Standard code for pressure piping.

Tabular values of weights for corresponding sizes of steel and wrought iron pipe are given and the normal wall thicknesses for the two materials have been adjusted to compensate for the difference in specific weights. Provisions for new materials and more severe service conditions than contemplated, even at present, are provided for in the new schedules in that the thicknesses are not tied to particular pressure-temperature conditions or materials as formerly.

Production Problems Engage Steel Mills

Most Producers Booked Through Year; Pig Iron Rate Up

MARKET IN TABLOID ★

Demand
Active in all products; auto, rail, building needs heavy

Prices
Wire products advanced; scrap at 15-year peak.

Production
Up 3½ points to 87½ per cent, best since May, 1937.

■ IRON and steel production continues to expand, and will rise further the next few weeks. Scrap prices have extended their recent sharp upturn, and finished steel quotations are edging upward on some products.

Consumers generally are covered for the quarter's requirements, in some cases through early 1940. Consequently, new business has moderated, but rising consumption is reflected in pressure for delivery and in heavier demands on warehouses by users unable to obtain sufficiently prompt shipment from mills.

In only a few cases are producers of the commoner steel products able to take additional business for shipment by Dec. 31. Some consumers are seeking places on first quarter schedules, but mills are accepting such business at open prices, and only a relatively small tonnage has been taken on this basis.

Steelmaking last week rose 3½ points to 87½ per cent, highest since May, 1937, and 25½ points better than a month ago. Several districts plan to add more steelmaking furnaces this week, and a national rate of 90 per cent or better is in early prospect.

September saw 31 blast furnaces added to the active list, the largest number to be lighted in one month since September, 1922. Daily average pig iron production last month was 95,757 tons, an increase of 11.6 per cent over August and more than 70 per cent ahead of the rate a year ago. Since many furnaces went in the latter part of the month, a more substantial upturn in production is seen for October.

Announcement of first quarter prices is deferred, as producers seek to determine the probable extent of the increase in their manufacturing costs. Meanwhile prices on merchant wire products are rising, advances of $3 a ton being made on barbed wire, nails and heavy fencing. Building and highway mesh also are up $3. Some plate producers with a small amount of unfilled capacity for the remainder of the year are quoting $5 a ton above the nominal market.

While scrap prices have given some indication of leveling off, further advances were recorded last week. STEEL'S scrap price composite increased $1.41 to $22.16, slightly exceeding the 1937 peak to reach the highest level in more than 15 years.

The automobile industry, although hampered by strikes at partsmakers' plants, are expanding assemblies rapidly and pressing material and parts suppliers for shipments. Motorcar production last week totaled 76,095 units, a gain of more than 13,000 and the largest output since June.

Railroad buying of rails and equipment has moderated somewhat following an unusually sharp upturn last month. A substantial number of cars and a heavy tonnage of rails and accessories remain to be placed. September freight car awards of 23,000 were almost double the total for all the preceding months this year. Foreign business in railroad equipment promises to swell the heavy demand from domestic roads.

Tin plate operations jumped 7 points last week to 90 per cent, an exceptionally high rate for this period. Resumption of operations at plants recently idle is helping to meet the heavy demand from both domestic and foreign consumers. Canadian buying is more active, reflecting curtailment of exports from Great Britain.

Export business in other steel products continues limited despite active inquiry from neutral countries. A number of foreign buyers are seeking pig iron here, with prices reported in excess of the domestic market. Export plate prices are up $4 a ton.

Structural and reinforcing bar markets are more active as builders seek to close on pending projects. Some reinforcing bar producers are turning down business. Structural awards and inquiries include nearly 6000 tons for plant expansion by aircraft interests and 3000 tons for a seaplane hangar. A government order for 329 army tanks will take 2500 to 3000 tons of plates, and the navy has bids ranging from $520 to $750 a ton on 21,250 tons of armor plate.

Most districts scored further gains in steelmaking last week. Pittsburgh was up 4 points to 83, Chicago rose 2 points to 86 and Youngstown increased 4 to 90, with another 4-point gain likely this week. Other advances included 3 points to 64 in eastern Pennsylvania; 5 points to 93 at Wheeling; 1½ points to 89 at Cleveland; 11½ points to 83½ at Buffalo; 5½ to 84 at Cincinnati; and 1 point to 100 at Detroit. Birmingham, unchanged at 86, will go to 90 this week. New England held at 100 and St. Louis continued at 72.

COMPOSITE MARKET AVERAGES

	Oct. 7	Sept. 30	Sept. 23	One Month Ago Sept., 1939	Three Months Ago July, 1939	One Year Ago Oct., 1938	Five Years Ago Oct., 1934
Iron and Steel	$37.74	$37.44	$37.16	$36.67	$35.82	$36.48	$32.10
Finished Steel	55.90	55.60	55.60	55.60	55.62	57.04	54.00
Steelworks Scrap..	22.16	20.75	20.00	17.97	14.72	14.00	9.40

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Oct. 7, 1939	Sept. 1939	July 1939	Oct. 1938
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.25c
Steel bars, Chicago	2.15	2.15	2.15	2.25
Steel bars, Philadelphia	2.47	2.47	2.47	2.57
Iron bars, Terre Haute, Ind.	2.05	2.05	2.05	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.00	2.00	2.00	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.15
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.00	2.00	2.00	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.15
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.55	2.40	2.40	2.45

Semifinished Material

Sheet bars, Pittsburgh, Chicago.	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	43.00	43.00	43.00	43.00

Pig Iron

	Oct. 7, 1939	Sept. 1939	July 1939	Oct. 1938
Bessemer, del. Pittsburgh	$24.34	$23.35	$22.34	$22.34
Basic, Valley	22.50	21.50	20.50	20.50
Basic, eastern, del. Philadelphia	24.34	23.54	22.34	22.34
No. 2 foundry, Pittsburgh	24.21	23.20	22.21	22.21
No. 2 foundry, Chicago	23.00	22.20	21.00	21.00
Southern No. 2, Birmingham	19.38	18.58	17.38	17.38
Southern No. 2 del. Cincinnati.	22.89	22.09	20.89	20.89
No. 2X, del. Phila. (differ. av.)	25.215	24.415	23.215	23.215
Malleable, Valley	23.00	22.00	21.00	21.00
Malleable, Chicago	23.00	22.20	21.00	21.00
Lake Sup., charcoal, del. Chicago	30.34	29.54	28.34	28.34
Gray forge, del. Pittsburgh	23.17	22.15	21.17	21.17
Ferromanganese, del. Pittsburgh.	105.33	95.35	85.33	97.77

Scrap

Heavy melting steel, Pittsburgh.	$24.25	$18.75	$15.55	$14.95
Heavy melt. steel, No. 2, E. Pa.	20.25	17.10	13.55	12.95
Heavy melting steel, Chicago	19.75	16.25	13.55	13.05
Rails for rolling, Chicago	22.25	19.65	17.75	16.25
Railroad steel specialties, Chicago	21.75	18.00	15.50	15.55

Coke

Connellsville, furnace, ovens	$5.00	$3.75	$3.75	$3.75
Connellsville, foundry, ovens	6.00	5.00	5.00	5.00
Chicago, by-product fdry., del.	10.50	10.50	10.50	10.50

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.00c
Chicago, Gary	2.00c
Cleveland	2.00c
Detroit, del.	2.10c
Buffalo	2.00c
Sparrows Point, Md.	2.00c
New York, del.	2.24c
Philadelphia, del.	2.17c
Granite City, Ill.	2.10c
Middletown, O.	2.00c
Youngstown, O.	2.00c
Birmingham	2.00c
Pacific Coast points	2.50c

Cold Rolled

Pittsburgh	3.05c
Chicago, Gary	3.05c
Buffalo	3.05c
Cleveland	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.37c
New York, del.	3.39c
Granite City, Ill.	3.15c
Middletown, O.	3.05c
Youngstown, O.	3.05c
Pacific Coast points	3.65c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.80c
Pacific Coast	4.50c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	24.00	35.00
Cold stp.	22.00	22.50	32.00	52.00

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c-2.34c
Philadelphia, del.	2.15c-2.40c
Boston, delivered	2.46c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.35c
Sparrows Point, Md.	2.10c
Claymont, Del.	2.10c-2.35c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Pittsburgh	3.35c
Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(*Base, 20 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Duluth	2.25c
Birmingham	2.15c
Cleveland	2.15c
Buffalo	2.15c
Detroit, delivered	2.25c
Philadelphia, del.	2.47c
Boston, delivered	2.52c
New York, del.	2.49c
Gulf ports	2.50c
Pacific Coast points	2.75c

Rail Steel

(*Base, 5 tons or over*)

Pittsburgh	2.15c
Chicago or Gary	2.15c
Detroit, delivered	2.25c
Cleveland	2.15c

Buffalo	2.15c
Birmingham	2.15c
Gulf ports	2.50c
Pacific Coast points	2.75c

Iron

Chicago, Terre Haute	2.05c
Philadelphia	2.37c
Pittsburgh, refined	3.50-8.00c

Reinforcing

*New Billet Bars, Base**

Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt., Pitts.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

*Rail Steel Bars, Base**

Pittsburgh, Gary Chicago, Buffalo, Cleveland, Birm.	1.90c
Gulf ports	2.25c
Pacific Coast ports	2.35c

**Base prices 20 cents less per 100 lbs. in lots of 20 tons or over of one size, in lengths of 30 feet or over, for shipment at one time to one destination.*

Wire Products

Pitts-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.55
Cement coated nails	2.55
(Per pound)	
Polished fence staples	2.55c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.88; two-point cattle, 80-rod spool	$2.70
Annealed fence wire	2.90c
Galv. fence wire	3.30c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh $3.70

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.65c	3.35c
Chicago	2.65c	3.35c
Gary, Ind.	2.65c	3.35c
Detroit	2.70c	*3.45c
Cleveland	2.65c	3.35c
Buffalo	2.65c	3.35c

* Delivered.

Alloy Bars (Hot)

(Base, 20 tons or over)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.70c
Detroit, delivered	2.80c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Strip and Hoops

(Base, hot strip, 1 ton or over; cold, 3 tons or over)

Hot Strip, 12-inch and less

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.00c
Detroit, del.	2.10c
Philadelphia, del.	2.32c
New York, del.	2.36c
Cooperage hoop, Youngs., Pitts.; Chicago, Birm.	2.10c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.80c
Chicago	2.90c
Detroit, del.	2.90c
Worcester, Mass.	3.00c

Carbon	Cleve., Pitts.
0.26—0.50	2.80c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass. $4 higher.

Commodity Cold-Rolled Strip

Pitts.-Cleve.-Youngstown	2.95c
Detroit, del.	3.05c
Worcester, Mass.	3.95c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, for full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	68.5 off
Do. larger, to 1-in.	66 off
Do. 1⅛ and larger	64 off
Tire bolts	52.5 off

Stove Bolts

In packages with nuts separate 72.5 off; with nuts attached add 15%; bulk 83.5 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts	60 off
Elevator bolts	60 off
Plow bolts	68.5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	67	70
⅞-1-inch	64	65
1⅛ and larger	62	62

Hexagon Cap Screws

Upset, 1-in., smaller	70.0 off

Square Head Set Screws

Upset, 1-in., smaller	75.0 off
Headless set screws	64.0 off

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, 11 and 12	63½ 54
Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½ "O.D.	13	$ 9.72	$23.71
1¾ "O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼ "O.D.	13	13.79	21.68
2¼ "O.D.	12	15.16	.....
2½ "O.D.	12	16.58	26.57
2¾ "O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½ "O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1 "O.D.	13	$ 7.82	$ 9.01
1¼ "O.D.	13	9.26	10.67
1½ "O.D.	13	10.23	11.79
1¾ "O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼ "O.D.	13	14.54	16.76
2¼ "O.D.	12	16.01	18.45
2½ "O.D.	12	17.54	20.21
2¾ "O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½ "O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½ "O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$45.00-46.00
4-in., Birmingham	48.00-49.00
4-in., Chicago	56.80-57.80
6-in. & over, Chicago	53.80-54.80
6-in. & over, east fdy.	49.00
Do., 4-in.	52.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 11/32-in.incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$5.00
Connellsville, fdry.	5.75 -6.25
Connell. prem. fdry.	6.00 -6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Terre Haute, del.	10.00
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c

Per ton, bulk, f.o.b. port

Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$24.00	$24.50	$23.50	$25.00
Birdsboro, Pa.	24.00	24.50	23.50	25.00
Birmingham, Ala.‡	19.38	.....	18.38	24.00
Buffalo	23.00	23.50	22.00	24.00
Chicago	23.00	23.00	22.50	23.50
Cleveland	23.00	23.00	22.50	23.50
Detroit	23.00	23.00	22.50	23.50
Duluth	23.50	23.50	.....	24.00
Erie, Pa.	23.00	23.50	22.50	24.00
Everett, Mass.	24.00	24.50	23.50	25.00
Granite City, Ill.	23.00	23.00	22.50	23.50
Hamilton, O.	23.00	23.00	22.50	.....
Neville Island, Pa.	23.00	23.00	22.50	23.50
Provo, Utah	21.00	.....	.....	.....
Sharpsville, Pa.	23.00	23.00	22.50	23.50
Sparrow's Point, Md.	24.00	.....	23.50	.....
Swedeland, Pa.	24.00	24.50	23.50	25.00
Toledo, O.	23.00	23.00	22.50	23.50
Youngstown, O.	23.00	23.00	22.50	23.50
Delivered from Basing Points:				
Akron, O., from Cleveland	24.39	24.39	23.89	24.89
Baltimore from Birmingham	24.78	.....	23.66	.....
Boston from Birmingham	24.12	.....	.....	.....
Boston from Everett, Mass.	24.50	25.00	24.00	25.50
Boston from Buffalo	24.50	25.00	24.00	25.50
Brooklyn, N. Y., from Bethlehem	26.50	27.00	.....	.....
Canton, O., from Cleveland	24.39	24.39	23.89	24.89
Chicago from Birmingham	†23.22	.....	.....	.....
Cincinnati from Hamilton, O.	23.24	24.11	23.61	.....
Cincinnati from Birmingham	23.06	.....	22.06	.....
Cleveland from Birmingham	23.32	.....	22.82	.....
Mansfield, O., from Toledo, O.	24.94	24.94	24.44	24.44
Milwaukee from Chicago	24.10	24.10	23.60	24.60
Muskegon, Mich., from Chicago, Toledo or Detroit	26.19	26.19	25.69	26.69
Newark, N. J., from Birmingham	25.15	.....	.....	.....
Newark, N. J., from Bethlehem	25.53	26.03	.....	.....
Philadelphia from Birmingham	24.46	...	23.96	.....
Philadelphia from Swedeland, Pa.	24.84	25.34	24.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	25.45	25.45	24.95	24.95

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	23.50	23.50	23.00	....
St. Louis from Birmingham	†23.12	....	22.62	....
St. Paul from Duluth	25.63	25.63	....	26.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $28.50, base; $29.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$22.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	22.50	do., del. Chicago	30.34
		Lyles, Tenn.	26.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $27.50; 6.51-7—$28.00; 7-7.50—$28.50; 7.51-8—$29.00; 8-8.50—$29.50; 8.51-9—$30.00; 9-9.50—$30.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	55.10
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar

Washed gravel, duty pd., tide, net ton	$25.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	20.00
Do. barge	20.00
No. 2 lump	21.00-22.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $100.00
Do., del. Pittsburgh 105.33

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 32.00
Do., 26-28%, Palmerton 39.50

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicomanganese, 2½ c. 103.00
2% carbon, 108.00; 1%, 118.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 2.25

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.75c
1% carb.	17.50c	18.25c	18.75c
0.10% carb.	19.50c	20.25c	20.75c
0.20% carb.	18.50c	19.25c	19.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.75
Do, smaller lots 2.85

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c

88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do., 2% 12.50c
Spot ¼c higher

Silicon Briquets, contract carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.00c
Ton lots 5.50c
Less-ton lots 5.75c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: SAE 2300	Cold Drawn Bars: SAE 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.78	4.86	3.46	4.13	8.63	7.28
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.43	4.60	4.89	3.51	4.09	8.59	7.19
Philadelphia	3.85	3.85	4.35	3.55	3.55	5.25	3.55	4.55	4.43	3.51	4.06	8.56	7.16
Baltimore	3.95	4.10	4.45	3.70	3.70	5.25	3.55	4.90	5.05	....	4.05	....	....
Norfolk, Va.	3.90	4.00	....	3.75	3.75	5.20	3.75	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.35	4.40	4.50	3.42	3.75	8.15	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.75	3.35	3.65	8.35	6.95
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.55	4.62	3.20	3.75	8.15	6.75
Detroit	3.33	3.43	3.68	3.60	3.65	5.27	3.43	4.50	4.59	3.40	3.80	8.45	7.05
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	....	4.57	3.45	4.00	8.50	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.35	4.30	4.85	3.50	3.75	8.15	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.60	4.95	4.50	3.83	4.34	8.84	7.44
Milwaukee	3.63	3.73	3.73	3.68	3.68	5.28	3.48	4.43	4.73	....	3.88	8.38	6.98
St. Louis	3.62	3.72	3.72	3.47	3.47	5.07	3.38	4.32	4.52	3.61	4.02	8.52	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Memphis	3.90	4.00	4.00	3.95	3.95	5.71	3.75	....	5.00	....	4.31	....	....
Chattanooga	3.80	3.90	3.90	3.85	3.85	5.80	3.65	....	4.40	....	4.39	....	....
Tulsa, Okla.	4.44	4.54	4.54	4.33	4.33	5.93	4.24	....	5.19	....	4.69	....	....
Birmingham	3.50	3.60	3.60	3.55	3.55	5.88	3.35	....	4.85	....	4.43	....	....
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60	5.00	5.10	....	....
Houston, Tex.	4.05	6.20	6.20	4.05	4.05	5.75	4.20	....	5.25	....	....	....	....
Seattle	4.00	3.85	5.20	3.40	3.50	5.75	3.70	6.50	4.75	....	5.60	....	....
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75	....	5.85	....	....
Los Angeles	4.15	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.00	4.45	6.15	10.40	9.55
San Francisco	4.00	4.35	6.00	4.00	4.00	5.60	3.75	6.40	5.15	....	6.55	10.65	9.80

	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.18	7.50	6.05	5.80	7.90
New York (Met.)	4.04	7.35	5.90	5.65	....
Philadelphia	4.10	7.31	5.86	5.61	7.71
Baltimore	4.10	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.10	5.65	5.40	7.50
Pittsburgh	3.40	7.35	5.95	5.50	7.60
Cleveland	3.30	7.30	5.85	5.85	7.70
Detroit	3.38	7.42	5.97	5.72	7.19
Cincinnati	3.65	7.44	5.99	5.74	7.84
Chicago	3.70	7.10	5.65	5.40	7.50
Twin Cities	3.95	7.45	6.00	6.09	8.19
Milwaukee	3.78	7.33	5.88	5.63	7.73
St. Louis	3.82	7.47	6.02	5.77	7.87
Seattle	5.85	....	8.00	7.85	8.65
Portland, Oreg.	5.70		7.80	7.65	8.50
Los Angeles	4.80	9.40	8.55	8.40	9.05
San Francisco	5.00	9.65	8.80	8.65	9.30

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds, except 0-1999 pounds (hot rolled sheets only) in New York; 300-1999 pounds in Los Angeles; 0-299 pounds (hoops only) in San Francisco; 300-4999 pounds in Portland, Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in Birmingham.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York and St. Louis; 450-3749 pounds in Boston; 500-1499 pounds in Buffalo; 1000-1999 pounds in Philadelphia; 300-4999 pounds in San Francisco and Portland; any quantity in Twin Cities.

Galvanized Sheets: Base, 0-1499 pounds in New York, Tulsa; 150-1499 pounds in Cleveland, Milwaukee, Pittsburgh; 1-9 bundles in Baltimore, Norfolk; 1-6 bundles in Los Angeles; 300-4999 pounds in Portland, San Francisco; 450-3749 pounds in Boston; 500-1499 pounds in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, St. Louis; 1500 pounds and over in Chattanooga, Philadelphia; any quantity in Twin Cities.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1000 pounds and over. Several leading districts plan increase to 1500 pounds this week.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999 pounds in San Francisco; 0-1999 in Portland.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Oct. 5

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channel or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$20.25 5 0 0	$18.32	2 3 0
Basic bessemer	....	19.59	2 6 0
Hematite, Phos. .03-.05	21.26 5 5 0*	.....	.....
Billets	$29.87 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	46.07 11 7 6	43.67	5 2 6
Standard rails	$38.48 9 10 0	$48.99	5 15 0
Merchant bars	1.99c 11 0 0	1.81c to 1.90c	4 15 0 to 5 0 0
Structural shapes	1.81c 10 0 0	1.76c to 1.81c	4 12 6 to 4 15 0
Plates, †¼ in. or 5 mm.	1.98c 10 18 9	2.47c	6 10 0
Sheets, black, 24 gage or 0.5 mm.	2.35c 13 0 0	3.23c	8 10 0°
Sheets, gal., 24 ga., corr.	2.85c 15 15 0	3.47c	9 2 6
Bands and strips	2.22c 12 5 0	1.90c to 1.92c	5 0 0 to 5 1 0
Plain wire, base	3.53c 19 10 0	3.80c	10 0 0
Galvanized wire, base	4.21c 23 5 0	4.56c	12 0 0
Wire nails, base	....	3.99c	10 10 0
Tin plate, box 108 lbs.	$4.10 1 0 3	.....	.....

British ferromanganese >100.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich §§Mark
Fdy. pig iron, Si. 2.5	$30.04	4 19 0(a)	$15.56	679.30	$18.48	550	$25.20	63
Basic bess. pig iron	18.73	4 12 6(a)	.....	....	.....	...	27.80	(b)69.50
Furnace coke	4.66	1 4 2	5.15	225	6.79	202	7.60	19
Billets	29.87	7 7 6	23.56	1,029	28.90	860	38.60	96.50
Standard rails	1.72c	9 10 0	1.41c	1,405	2.06c	1,375	2.38c	132
Merchant bars	2.10c	11 12 0††	1.30c	1,304	2.03c	1,350	1.98c	110
Structural shapes	1.88c	10 8 0††	1.27c	1,268	1.97c	1,315	1.93c	107
Plates, †¼-in. or 5 mm.	1.98c	10 19 3††	1.65c	1,650	2.06c	1,375	2.29c	127
Sheets, black	2.67c	14 15 0§	1.96c	1,958‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.12c	17 5 0	2.85c	2,850	4.05c	2,700	6.66c	370
Plain wire	3.53c	19 10 0	2.00c	2,000	2.48c	1,650	3.11c	173
Bands and strips	2.23c	12 7 0††	1.44c	1,444	2.06c	1,375	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling not quoted. §§Last prices, no current quotations.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; †indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	17.00-17.50
New Eng. del. No. 1	18.00-19.00
Buffalo, No. 1	22.00-22.50
Buffalo, No. 2	20.00-20.50
Chicago, No. 1	19.50-20.00
Chicago, auto, no alloy	18.00-18.50
Chicago, No. 2 auto	15.50-16.00
Cincinnati dealers	16.50-17.00
Cleveland, No. 1	19.75-20.25
Cleveland, No. 2	18.75-19.25
Detroit, No. 1	†17.50-18.00
Detroit, No. 2	†16.50-17.00
Eastern Pa., No. 1	22.50-23.00
Eastern Pa., No. 2	20.00-20.50
Federal, Ill.	17.00-17.50
Granite City, R. R.	17.75-18.25
Granite City, No. 2	17.00-17.50
Los Angeles, No. 1	15.50-16.00
Los Angeles, No. 2	14.50-15.00
L. A., No. 1 f.a.s.	20.50-21.00
L. A., No. 2 f.a.s.	19.50-20.00
N. Y. dock No. 1 exp.	17.00
Pitts., No. 1 (R. R.)	25.50-26.00
Pittsburgh, No. 1	24.00-24.50
Pittsburgh, No. 2	22.50-23.00
St. Louis, R. R.	17.00-17.50
St. Louis, No. 2	17.00-17.50
San Francisco, No. 1	15.50-16.00
San Francisco, No. 2	14.50-15.00
Seattle, No. 11	14.00-14.50
Toronto, dlrs, No. 1.	9.75-10.25
Valleys, No. 1	22.00-22.50

COMPRESSED SHEETS

Buffalo, new	20.00-20.50
Chicago, factory	19.00-19.50
Chicago, dealers	18.00-18.50
Cincinnati, dealers	16.00-16.50
Cleveland	19.25-19.75
Detroit	†19.00-19.50
E. Pa., new mat	22.50-23.00
E. Pa., old mat.	19.50-20.00
Los Angeles	14.00-14.50
Pittsburgh	24.00-24.50
St. Louis	14.50-15.00
San Francisco	14.00-14.50
Valleys	21.00-21.50

BUNDLED SHEETS

Buffalo, No. 1	20.00-20.50
Buffalo, No. 2	17.50-18.00
Cleveland	15.75-16.75
Los Angeles	14.00
Pittsburgh	22.50-23.00
St. Louis	13.00-13.50
Toronto, dealers	8.50- 9.00

SHEET CLIPPINGS, LOOSE

Chicago	14.00-14.50
Cincinnati dealers	11.50-12.00
Detroit	†14.00-14.50
†Los Angeles	3.75- 4.00
St. Louis	12.00-12.50
Toronto, dealers	4.75- 5.25

BUSHELING

Buffalo, No. 1	20.00-20.50
Chicago, No. 1	18.00-18.50
Cincin., No. 1, deal.	12.00-12.50
Cincinnati, No. 2	5.50- 6.00
Cleveland, No. 2	11.50-12.00
Detroit, No. 1, new	†17.00-17.50
Valleys, new, No. 1	19.50-20.00
Toronto, dealers	4.25- 4.75

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	13.50-14.00
Chicago	12.00-12.50
Cincinnati, dealers	7.50- 8.00
Cleveland, no alloy	9.00- 9.50
Detroit	†10.00-10.50
Eastern Pa.	14.50-15.00
Los Angeles	5.00
New York	†6.50- 7.00
Pittsburgh	15.50-16.00
St. Louis	9.00- 9.50
San Francisco	5.00
Toronto, dealers	4.75- 5.25
Valleys	13.50-14.00

SHOVELING TURNINGS

Buffalo	15.00-15.50
Cleveland	11.00-11.50
Chicago	12.50-13.00
Chicago, spcl, anal.	13.50-14.00
Detroit	†13.00-13.50
Pitts., alloy-free	18.00-18.50

BORINGS AND TURNINGS
For Blast Furnace Use

Boston district	†6.75- 7.50
Buffalo	13.00-13.50
Cincinnati, dealers	6.50- 7.00
Cleveland	11.00-12.00
Eastern Pa.	13.00-13.50
Detroit	†10.50-11.00
New York	†3.50- 4.00
Pittsburgh	13.00-13.50
Toronto, dealers	4.00- 4.50

AXLE TURNINGS

Buffalo	18.50-19.00
Boston district	†10.50-11.00
Chicago, elec. fur.	19.50-20.00
East. Pa. elec. fur.	20.00-20.50
St. Louis	13.50-14.00
Toronto	4.50- 4.75

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†8.00- 8.50
Buffalo	13.00-13.50
Chicago	12.00-12.50
Cincinnati, dealers	6.50- 7.00
Cleveland	11.00-12.00
Detroit	†10.50-11.00
E. Pa., chemical	14.50-15.00
New York	†3.50- 4.00
St. Louis	9.00- 9.50
Toronto, dealers	4.25- 4.75

RAILROAD SPECIALTIES

Chicago	21.50-22.00

ANGLE BARS—STEEL

Chicago	22.50-23.00
St. Louis	21.00-22.00

SPRINGS

Buffalo	24.50-25.00
Chicago, coil	23.00-23.50
Chicago, leaf	21.50-22.00
Eastern Pa.	26.00-26.50
Pittsburgh	28.50-29.00
St. Louis	21.00-21.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	24.50-25.00
Chicago (3 ft.)	22.50-23.00
Chicago (2 ft.)	23.00-23.50
Cincinnati, dealers	23.50-24.00
Detroit	†24.50-25.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	28.50-29.00
St. Louis, 2 ft. & less	21.50-22.00

STEEL RAILS, SCRAP

Boston district	†15.50-16.00
Buffalo	22.00-22.50
Chicago	19.50-20.00
Cleveland	20.00-20.50
Pittsburgh	26.50-27.00
St. Louis	18.00-18.50
Seattle	18.00-18.50

FROGS, SWITCHES

Chicago	19.50-20.00
St. Louis, cut	18.00-18.50

ARCH BARS, TRANSOMS

St. Louis	20.00-20.50

PIPE AND FLUES

Chicago, net	14.50-15.00
Cincinnati, dealers	12.50-13.00

RAILROAD GRATE BARS

Buffalo	15.50-16.00
Chicago, net	13.00-13.50
Cincinnati, dealers	10.00-10.50
Eastern Pa.	18.50-19.00
New York	†13.50-14.00
St. Louis	13.00-13.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	22.50-23.00
St. Louis, No. 1	12.75-13.25
St. Louis, No. 2	17.50-18.00

FORGE FLASHINGS

Boston district	†12.25-12.75
Buffalo	20.00-20.50
Cleveland	18.00-18.50
Detroit	†17.00-17.50
Los Angeles	9.00
Pittsburgh	21.00-21.50

FORGE SCRAP

Boston district	†7.00
Chicago, heavy	23.00-23.50

LOW PHOSPHORUS

Cleveland, crops	17.50-18.00
Eastern Pa., crops	26.00-26.50
Pitts., billet, bloom, slab crops	30.00-30.50

LOW PHOS. PUNCHINGS

Buffalo	23.00-23.50
Chicago	22.00-22.50
Cleveland	20.00-21.00
Eastern Pa.	26.50-27.00
Pittsburgh	25.50-26.00
Seattle	15.00
Detroit	†19.50-20.00

RAILS FOR ROLLING
5 feet and over

Birmingham	†14.00-15.00
Boston	†17.00-17.50
Chicago	22.00-22.50
New York	†18.50-19.00
Eastern Pa.	24.00-24.50
St. Louis	20.00-20.50

STEEL CAR AXLES

Birmingham	†15.00-16.00
Boston district	†18.50-19.00
Chicago, net	22.00-22.50
Eastern Pa.	25.00-25.50
St. Louis	22.00-22.50

LOCOMOTIVE TIRES

Chicago (cut)	21.00-21.50
St. Louis, No. 1	18.00-18.50

SHAFTING

Boston district	†18.50-19.00
New York	†18.00-19.00
Eastern Pa.	25.00-25.50
St. Louis, 1¼-3¾"	19.50-20.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†15.00-15.50
Buffalo, steel	24.50-25.00
Chicago, iron	19.00-19.50
Chicago, rolled steel	22.00-22.50
Cincin., iron, deal.	19.00-19.50
Eastern Pa., iron	23.50
Eastern Pa., steel	26.00-26.50
Pittsburgh, iron	22.00-22.50
Pittsburgh, steel	28.50-29.00
St. Louis, iron	19.50-20.00
St. Louis, steel	21.00-21.50

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†17.00-17.50
N. Eng. del. No. 2	17.50-18.50
N. Eng. del. textile	20.00-25.00
Buffalo, cupola	20.00-20.50
Buffalo, mach.	21.00-21.50
Chicago, agri. net	15.50-16.00
Chicago, auto net	16.50-17.00
Chicago, railroad net	16.50-17.00
Chicago, mach. net	17.00-17.50
Cincin., mach. deal.	19.50-20.00
Cleveland, mach.	19.50-20.00
Detroit, cupola, net	†16.50-17.00
Eastern Pa., cupola	24.00-25.00
E. Pa., mixed yard	20.00-20.50
Los Angeles, net	15.00-15.50
Pittsburgh cupola	22.50-23.00
San Francisco, del.	12.50-13.00
Seattle	16.00-16.50
St. Louis, cupola	17.00-17.50
St. Louis agri. mach.	17.00-17.50
St. L., No. 1 mach.	18.00-18.50
San Francisco	14.50-15.00
Toronto, No. 1, mach., net, dealers	15.00-15.50

HEAVY CAST

Boston dist. break.	†15.00-15.50
New England, del.	16.00-17.00
Buffalo, break.	17.50-18.00
Cleveland, break, net	13.00-13.50
Detroit, auto net	†17.50-18.00
Detroit, break.	†14.50-15.00
Eastern Pa.	22.00-22.50
Los Ang., auto, net.	13.50
New York, break.	†16.50-17.00
Pittsburgh, break	19.00-19.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†14.00-14.50
Buffalo	16.00-16.50
Chicago, net	12.50-13.00
Cincinnati, dealers	10.75-11.25
Detroit, net	†11.00-11.50
Eastern Pa.	18.50-19.00
New York, fdy.	13.00-13.50
St. Louis	12.00-12.50
Toronto dealers, net	9.00- 9.50

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	11.50-12.50
Buffalo	22.50-23.00
Chicago, R. R.	22.00-22.50
Cincin., agri., deal.	16.00-16.50
Cleveland, rail	21.50-22.00
Eastern Pa., R. R.	22.00-22.50
Los Angeles	15.00
Pittsburgh, rail	24.00-24.50
St. Louis, R. R.	18.50-19.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ %
Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbessemer	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbessemer	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	14.00-15.00
No. Afr. low phos. nom.	14.00
Spanish No. Africa basic, 50 to 60%	nom.
Tungsten, short ton unit, duty pd. nom.	$23.75-25.00
Newfoundland fdry. 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.00-26.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nominal	nom.
So. African, 50-52% nominal	nom.
Indian, 49-50%	nom.

Sheets, Strip

Sheet & Strip Prices, Page 74, 75

Pittsburgh—Producers still are not certain how fully booked they are for the ensuing three months. Whether or not some additional business can be accepted cannot be determined immediately. Meanwhile pressure continues from buyers for prices and placements on first quarter schedules. Production is estimated at slightly better than 75 per cent for sheets and about 65 for strip. Galvanized output is approaching 80 per cent.

Chicago—Production is at practical capacity. Automotive needs form a large part of shipments, being heavier than expected. Farm equipment builders also are accounting for larger lots. Mills have not yet determined whether all orders at hand can be filled this quarter.

Boston — What slight decline in narrow cold strip buying is noted is caused by sellers who in most instances have no mill capacity available for shipment the balance of the year. Nevertheless pressure to get on mill books continues, and some volume is being booked for shipment next quarter at open prices. Steel consumption has been stepped up materially by some industries.

New York — Consumption continues active, with stovemakers pressing for deliveries. Refrigerator specifications reflect seasonal trends, being lighter than at any time since early spring, although better sustained than expected.

While most consumers covered requirements for this year there has been further buying at the $5 advance put into effect late last month by two eastern sellers on hot rolled sheets, where deliveries can be made this fall. Indications point to an opening of books for first quarter before this month is over. Most narrow cold strip mills are at capacity.

Philadelphia — Larger mills are booked 12 to 14 weeks ahead on cold, hot rolled, and galvanized sheets. Some eastern producers still able to promise some tonnage for fourth quarter at a $5 advance report fair business on this basis. Improved deliveries are seen for first quarter, since pressure from automotive interests is expected to slacken.

Cincinnati—Sheet mills are virtually out of the market, order departments being concerned chiefly with inquiries for first quarter delivery. Export business is light, although foreign inquiries have been heavy.

Birmingham, Ala. — Sheet production has shown a marked increase to better than 80 per cent.

Plates

Plate Prices, Page 74

Cleveland—Pere Marquette railroad is asking bids until Nov. 20 on a new car ferry involving a substantial plate tonnage. Mills are either sold out on plates for the remainder of the year or can accept only a small additional tonnage for shipment by Dec. 31.

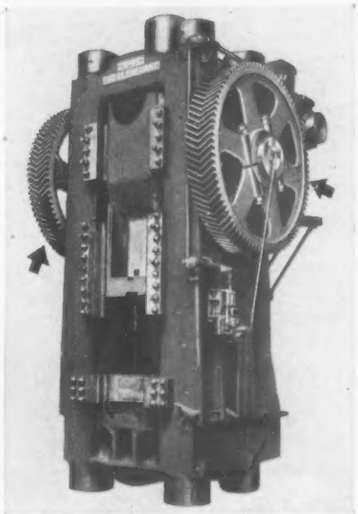
Boston—While plate buying shows but slight improvement, more business is being done at the recent $5 advance, although all eastern mills, notably larger producers, have not yet announced the increase. In spots plate fabricators are slightly more active, but substantial backlogs are lacking.

New York — About 5499 tons of steel will be required for two C-1

FARREL-SYKES GEARS

Strengthen the Rugged Dependability of Cleveland Power Presses

Farrel-Sykes Gears are used in Cleveland heavy duty forging-sizing presses because they provide added strength with reduced weight and size. This additional strength and high load-carrying capacity is due to the greater bearing surface provided by the continuous herringbone teeth. Precision generated by the famous Sykes process, they operate with extreme quietness and smoothness.



Farrel-Sykes continuous tooth herringbone gears provide a smooth, quiet, efficient drive for these heavy duty forging-sizing presses built by the Cleveland Punch & Shear Works Company.

Wear is retarded and involute profile and correct tooth action maintained throughout the life of the gears by the combined characteristics of overlap or interlacing of the teeth, creeping engagement and inclined line of pressure. Harmful thrust loads with resultant stresses on other parts of the machinery are prevented by the opposed helices, which balance and absorb axial thrust within the gear member itself.

As a result of these and other advantages inherent in Farrel-Sykes gears, they can be depended upon for efficient, economical performance and long life under severe operating conditions.

When you have a gear or drive problem take advantage of the extensive experience of the Farrel organization in designing, manufacturing and operating gears and gear units for every type of service.

FARREL SYKES GEARS

FARREL-BIRMINGHAM COMPANY, Inc.
322 VULCAN STREET - - - - BUFFALO, N. Y.
The Gear with a Backbone

ships just awarded by the maritime commission to the Pennsylvania Ship Yard Co. Inc., Beaumont, Tex. The 329 army tanks to be built by American Car & Foundry Co. will take 2500 to 3000 tons of plates. Additional armament business in scout cars, tractors, bomb trailers and trucks is in prospect.

Philadelphia—Plate mills continuing to quote 2.10c, base, find it necessary to turn down considerable business, and for all practical purposes are out of the market for balance of the year. Independent mills are naming 2.35c, although one independent producer continues to quote 2.10c, Claymont base. Railroads now are covered on specified requirements through fourth quarter at 2.10c, and shipbuilders have the same price on contract work. Pusey & Jones Corp., Philadelphia, has placed 1025 tons of plates with an eastern mill for a ferryboat for Virginia Ferry Co.

Seattle—Hydraulic Supply Mfg. Co. has the contract to fabricate 7945 feet of 30-inch enameled water pipe for Tacoma, involving 450 tons of 5/16-inch plates. Cathlamet, Wash., has opened bids on a 200,000-gallon water tank. Boiler and tank shops report improved demand for small jobs.

Birmingham, Ala. — Southern plate production is likely to be increased as a result of freight car buying, and the $10,000,000 shipbuilding order recently awarded Ingalls Iron Works by the maritime commission.

San Francisco—An unnamed interest secured approximately 2000 tons of liner plates for a reinforced concrete pipe line for Los Angeles. Moore Drydock Co. is expected to build three C-3 type cargo vessels for the United States maritime commission involving 8280 tons of plates and 5520 tons of shapes. Awards aggregated 2141 tons and brought the total to date to 79,476 tons, against 27,617 tons in the 1938 period.

Washington — The war department has awarded American Car & Foundry Co. a contract for 329 military tanks to cost about $6,000,000. Tanks are of the latest type weighing approximately 12 tons.

Baltimore—While theoretically the delivered price here on plates is 2.1425c, figured on a 2.10c base at Sparrows Point, the actual price on most tonnage available for delivery this year is $5 a ton higher. This results from recent advances by some eastern mills who apparently are assuming a 2.35c base at Sparrows Point instead of quoting 2.35c, Claymont, Del.

INLAND FLOOR PLATE Gives 4-WAY Protection

1 **INCREASES SAFETY**—The cleated surface gives better, firmer traction in all directions. Accidents are fewer. Traffic moves faster—safely.

2 **SPEEDS PRODUCTION**—men and machines move faster over safe, firm floors.

3 **LASTS LONGER**—No other flooring material compares with rolled steel for strength, toughness and resistance to continuous traffic wear.

4 **CUTS FLOOR MAINTENANCE COSTS**—Inland 4-Way Floor Plate cannot split, chip, roughen. It is easy to clean—reduces maintenance cost to a minimum.

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INLAND STEEL CO.

38 South Dearborn Street, Chicago

Sheets • Strip • Tin Plate • Bars • Plates • Floor Plates • Structurals • Piling • Rails • Track Accessories • Reinforcing Bars

Plate Contracts Placed

2000 tons, liner plates for 102-inch reinforced concrete pipe line, water and power department, Los Angeles, to unnamed interest.

700 tons, seven oil tanks, Standard Oil Co. of Indiana, Davenport, Ia., to Chicago Bridge & Iron Co., Chicago.

629 tons, bureau of reclamation, invitation 33,314-A, for delivery at Sacramento, Calif., to Youngstown Sheet & Tube Co., Youngstown, O.

450 tons, 30-inch water supply pipe, Tacoma, Wash., to Hydraulic Supply Mfg. Co., Seattle, at $149,797.

250 tons, 25-ton revolving crane on steel pontoon, specification 9368, Mare Island, Calif., to Dravo Corp., Pittsburgh.

190 tons, two oil tanks, Standard Oil Co. of Indiana, Cape Girardea, Mo., to Chicago Bridge & Iron Co., Chicago.

Unstated, tank and tower, veterans' hospital, Wadsworth, Kan., to Chicago Bridge & Iron Co., Chicago, $21,480.

Unstated tonnage, steel barges, U. S. engineers, to Nashville Bridge Co., Nashville, Tenn., $9200.

Plate Contracts Pending

8,280 tons, three C-3 type cargo vessels, United States maritime commission; Moore Drydock Co., Oakland, Calif., low.

12,000 tons, sewer project, Wichita, Kans., with alternate bids on concrete pipe.

750 tons, 30-inch welded steel line pipe,

San Diego, Calif.; alternate on cast iron or cement asbestos pipe; bids opened.

100 tons or more, 200,000-gallon tank, Cathlemet, Wash.; bids in.

Bars

Bar Prices, Page 74

Cleveland — Producers profess to be sold out for the remainder of the year, although in some cases future production schedules have not been completed to determine accurately what tonnage can be accommodated. Backlogs reflect heavy buying in anticipation of higher extras now effective on carbon and alloy material, some buyers having covered six months ahead.

Boston—New buying is lighter, but warehouses and large consumers are covered through the quarter. While consumption has increased, inventories of secondary distributors are heavier.

Carnegie-Illinois Steel Corp. has been awarded 221,000 pounds of chromium molybdenum steel bars for the Springfield, Mass., armory at 9.22c, delivered, bids Sept. 25.

New York — Apart possibly from the railroads, there is an easing up in new buying of bars by major consuming groups, most of whom have been able to cover likely requirements over the remainder of the year. Railroad stocks had been low, and with many equipment and repair programs now being formulated, the carriers are exerting considerable pressure for as early shipment as possible. Consumption in all leading lines is brisk.

Philadelphia—Demand is less active since most consumers placed heavy tonnage just prior to effective date of new extras. Nevertheless, considerable business is reported with full application of these extras. Bar mills are booked fairly well through the balance of the year, but some tonnage is still available after Dec. 1.

Birmingham, Ala.—Bars continue exceptionally brisk, merchant bars finding a ready market. Indications are that production will remain at the current high level for at least several weeks.

Buffalo — Bar mill operations generally are at capacity, but production is retarded in some instances by lack of sufficient semifinished steel supplies. Mills are heavily booked for the quarter, and business for shipment after Dec. 31 is being declined. The auto industry is prominent in current releases.

Ferroalloys

Ferroalloy Prices, Page 76

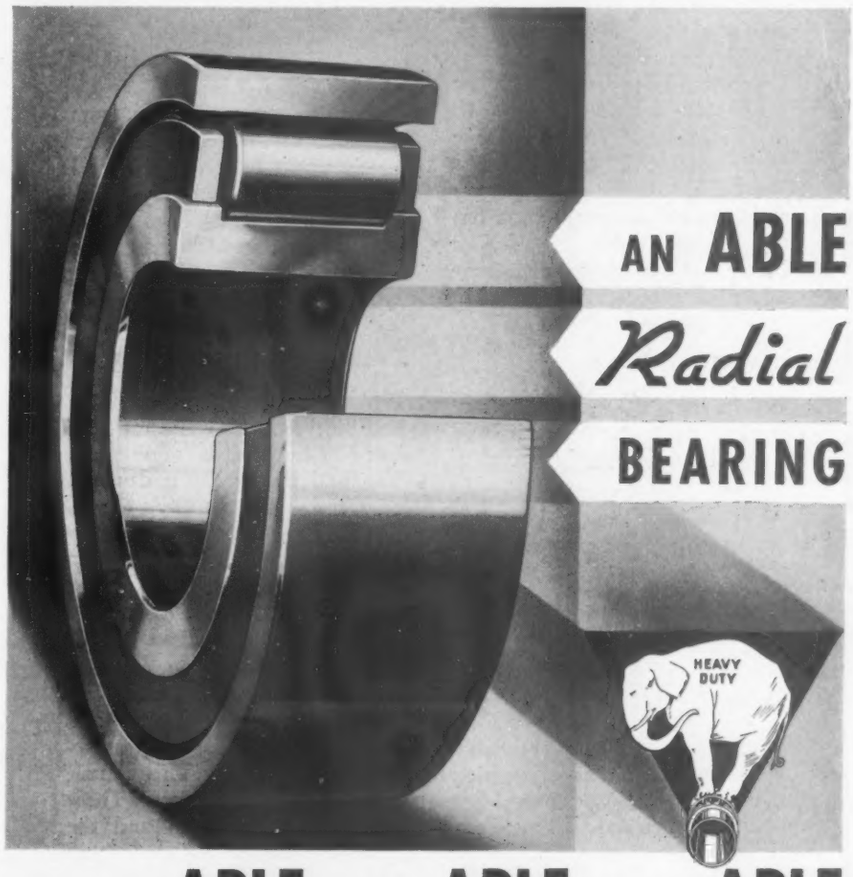
New York — The present high rate of steelmaking is reflected in demand for practically all ferro-alloys. However, prices are steady in most cases. Tungsten alloys are holding at the levels of a week ago, but may again be revised upward in the near future as the tungsten ore market continues strong.

Pipe

Pipe Prices, Page 75

Cleveland—Producers still are able to make relatively prompt delivery on standard pipe. This commodity did not participate as freely as other products in the recent buying wave, jobbers being inclined to hold consigned stocks at previous levels in view of assurance from mills that adequate supplies were available. Business in oil country goods is fairly active, although line pipe orders are small.

Boston — Merchant pipe demand is steady and slightly improved in spots, with substantial tonnages to be bought later for heating and plumbing in connection with several large housing projects in this dis-



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American Radial Bearings (grooved inner-race type) are *able* to lower the maintenance costs and increase the performance-life of your heavy machinery. *Adaptable*—the outer race is removable for easy assembly. *Durable*—the races and rollers are made from a special, heat-treated alloy steel. *Reliable*—constant inspection and precision-tests assure absolute accuracy. Where the load is radial, specify American Radial Bearings.

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Heavy-Duty ROLLER BEARINGS

Behind the Scenes with STEEL

New Invention

■ Maybe it's because printers ink is in our nose, or perhaps because we can get a discount on subscriptions, but at any rate we have a ton of different magazines around the house and the little woman is always on our neck to sort them out and throw away the copies we've read and don't want. It has been quite a domestic problem but since our trip through the Irvin works of Carnegie-Illinois week before last we have found the solution. In the slab storage yard they have a whale of a big gadget that seems to be the answer to our prayers and it seems strange no one has told us about a *magazine depiler* before. Do you know of anyone who makes the home size model?

Lesson In Verse

■ The safety director at the Irvin works has poetry in his soul coupled with a good sense of humor. One of his masterpieces on the bulletin board reads:

When you hear the quitting bell,
You don't have to run like hell.
You may trip or you may fall,
And maybe not reach home at all.

Friendly Rivals

■ Interesting fact: In the last five years 3200 tons of stainless steel have been used in building streamlined trains. This compares with over 5000 tons of aluminum used in trains, subway and street cars, with another 4000 tons in composite cars.

What Next?

■ We've all seen a lot of figures and comparisons showing how much better off the working man is in this country than in any other in the world. John Love in the *Cleveland Press* the other day told about the necessity of larger parking grounds for workmen's cars, now that two and three shifts are on the job. But it is the Dinette Lunch Box Co. that pushes us still closer to Utopia with an electrically heated lunch box which is simply plugged into a convenient outlet on the job and a complete warm dinner is ready at the noon whistle. Three different hot dishes may be prepared and an insulated section protects cold dishes on the menu. What'll we have today, Butch, *lobster a la Newburgh?*

Specialization

■ A friend wrote last week from the hotel at Tulare, Calif., completely under the weather (adv.) and in bed with a heavy cold. The hotel seems to have special stationery for its sick guests, for across the top was printed: *What can we do to make you happy?*

Puzzler

■ At the convention in Pittsburgh, three fellows across the hall had to share the same room. The rate was $30.00 a day and they each paid the clerk $10.00 in advance when they checked in but later in the day the clerk discovered the rate should only be $25 and sent five one dollar bills to them by the bellhop. Since the boys were on an expense account they tipped the bellhop two bucks for his trouble and each took one of the three remaining dollars. This made their share each $9.00. Three times $9.00 is $27.00 and the $2.00 tip to the bellhop makes $29.00. *What happened to the other dollar?*

Scrambled Heads

■ At a glance last week it was hard to distinguish between world series news and war news in the headlines. Side by side on the front page: *Reds Invade Yanks' Stronghold. Artillery Pounds Westwall. Sharpshooting Derringer Best Bet For Reds. Allies to Continue Fight.* And our Buckeye state spirit cost us a half.

SHRDLU

trict. Industrial demand is fair and the Watertown, Mass., arsenal has bids on 4820 feet, small sizes. Cast pipe buying has subsided, but small-lot business holds, with releases against old orders well maintained.

New York—Heavy buying by utilities, substantial part of which is for protective stocks, features cast pipe demand which is well maintained. Tonnage sold utilities last month was the heaviest in years. Export inquiries are numerous and some sales are being made at premiums over domestic prices.

Birmingham, Ala.—Pipe business in the South, except for a 27,000-ton order just announced by American Cast Iron Pipe Co., continues in relatively small lots. Inquiries, however, are more numerous, and production is maintained at four to five days a week basis.

Seattle—About 800 tons of cast pipe is pending in this area, including 500 tons for Bremerton, Wash., and 230 tons for Vancouver, Wash. Netarts, Oreg., has opened bids on 11,200 feet of 4 and 6-inch steel water pipe.

San Francisco — Cast iron pipe awards of 3586 tons were the largest for any week so far this year, bringing the year's aggregate to 28,348 tons, compared with 24,905 tons a year ago. The east bay municipal utility district, Oakland, Calif., divided 3472 tons of 4 to 16-in. pipe among three producers. Pending business includes 1500 tons of cast iron, welded steel or cement asbestos pipe for San Diego, Calif. Bids have been opened on 1200 tons of 1-inch black pipe, invitation 33,343-A, for delivery at Coram, Calif.

Cast Pipe Placed

3472 tons, 4 to 16-inch, east bay municipal utility district, Oakland, Calif.; 2100 tons to United States Pipe & Foundry Co., Burlington, N. J., 1103 tons to National Cast Iron Pipe Co., Birmingham, Ala., 296 tons to American Cast Iron Pipe Co., Birmingham, Ala.

450 tons, 12 and 16-inch, Yonkers, N. Y., to Donaldson Iron Co., Emaus, Pa.

266 tons, 4 to 24-inch, Whittier, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

438 tons, 6, 8 and 12-inch Bremerton, Wash.; bids opened.

300 tons, cement lined, Panama, schedule 3603; United States Pipe & Foundry Co., Burlington, N. J., low, bids Sept. 25.

190 tons, 4 to 12-inch, Sacramento, Calif.; American Cast Iron Pipe Co., Birmingham, Ala., low.

188 tons, 4 to 8 inch, Porterville, Calif.; bids opened.

Unstated, system improvements, Coulee City, Wash.; N. Coluccio, Seattle, low.

Steel Pipe Placed

270 tons, 1-inch black pipe, bureau of reclamation, invitation A-38,446-B, delivery at Odair, Wash., to Laclede Steel Co., St. Louis.

Steel Pipe Pending

1200 tons, 1-inch, black pipe, bureau of reclamation, invitation 33,343-A, for delivery at Coram, Calif.; bids opened.

Wire

Wire Prices, Page 75

Cleveland — Merchant wire products, influenced by rising production costs and active demand, are moving to higher price levels. Barbed wire and 9-11 field fencing was raised $3 a ton by a Midwestern producer, while a Pittsburgh interest took the lead in advancing wire nails 15 cents a keg, or $3 a ton. Other makers are following suit, although formal announcements to this effect have not been made by some leading mills. The sharp rise in zinc the past few weeks is a factor in manufacturing costs on galvanized products.

Boston — Despite attempts by mills to retard new wire buying, pressure from widely diversified groups of consumers to get on mill books continues with but slight letdown. Having sold up to capacity for the balance of the year, sellers are taking orders for delivery early next quarter at prices prevailing at time of shipment. Outstanding has been diversification of business, the rush extending from rope to corset wire.

New York — Substantial volume of wire business now being taken is for delivery early next quarter at prices prevailing at time of shipment. Mill capacity for numerous products at current prices has been sold for the balance of the year. Demand for rods is brisk, but producers with finishing departments have little tonnage to offer. Manufacturing consumption of wire has increased, but considerable buying appears to be for inventories. Some mills have advanced welded fabric, including building and highway mesh, $3 a ton.

Birmingham, Ala. — Wire products, including all specifications, are in consistent demand. A large part of output is going directly into consumption. Production is unofficially estimated at near 90 per cent.

Baltimore — Releases continue active on manufacturers' wire, especially spring wire for furniture makers. Agricultural requirements are being stepped up, although Carolina tobacco growers have experienced a letup in European demand as a result of war, and are spending a bit cautiously. Wire sellers are booked up on most items for over the remainder of the year.

Rails, Cars

Track Material Prices, Page 75

A large number of freight cars remain to be placed, following heavy awards the past few weeks. Substantial rail purchases also are in prospect.

Great Northern is planning to build about 3200 cars in its own shops over a period of more than a year. Car repair program of the Illinois Central involves more than 10,000 cars.

Domestic freight car orders in September totaled 23,000 cars, bringing the nine-month total up to 35,456, against 9953 in the corresponding period last year, 49,706 in the first nine months of 1937, and 37,313 in the same period of 1936. The war department will take bids Oct. 10 on 123 gasoline tank cars, and the Lack-

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AND it's Erie Hammers again...Erie because texture and quality...toughness...the ability to stand the gaff... these characteristics must be forged into parts vital to safety in railroad transportation . . . and at reasonable costs. Erie Engineers have improved the design of Erie Hammers. . Erie Craftsmen have improved construction during Erie's 36 years of hammer building...so that you choose well in buying ERIE.
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awanna opens bids Oct. 13 on 100 gondolas. Car order comparisons follow:

	1939	1938	1937	1936
Jan.	3	25	17,806	2,050
Feb.	2,259	109	4,972	6,900
March	800	680	8,155	632
April	3,095	15	9,772	4,427
May	2,051	6,014	4,732	8,900
June	1,324	1,178	548	5,200
July	110	0	1,030	7,229
Aug.	2,814	182	1,475	225
Sept.	23,009	1,750	1,216	1,750
9 mos.	35,456	9,953	49,706	37,313
Oct.	.....	2,537	1,355	2,210
Nov.	.....	1,232	275	1,550
Dec.	.....	2,581	275	23,450
Total	.....	16,303	51,611	64,523

Car Orders Placed

Phelps Dodge Corp., New York, 20 to 30 thirty-yard air dump cars, to unnamed builder.

Utah Copper Co., New York, large capacitl ore cars and 30 thirty-yard air dump cars to unnamed builder.

Car Orders Pending

Atchison, Topeka & Santa Fe, 2800 freight cars. Also will rebuild 2500 box, automobile and refrigerator cars in own shops.

Chicago & Illinois Midland, 100 seventy-ton hopper cars.

Chicago, North Shore & Milwaukee, two 4-unit articulated passenger trains; court permission to purchase from St. Louis Car Co. at cost of $299,000 asked.

Great Northern, 3200 freight cars planned to be built in own shops over period of more than year.

Seaboard Air Line, 1250 cars, comprising 1000 fifty-ton box, 100 seventy-ton hoppers and 150 fifty-ton flat cars; bids Oct. 9.

United States navy, 31 freight cars; Haffner-Thrall Car Co., Chicago, low on 15 flat cars and 8 gondolas and American Car & Foundry Co., New York, low on 8 box cars.

Rail Orders Placed

Mobile & Ohio, 3000 tons of 90-pound rails, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Rail Orders Pending

Atchison, Topeka & Santa Fe, 91,000 tons, including fastenings.

Locomotives Placed

Norfolk & Western, 10 locomotives of 2-8-8-2 type, to its own shops.

Locomotives Pending

City of Richmond, Va., one 25-ton Diesel-mechanical locomotive and one 50-ton Diesel-electric locomotive; bids opened Oct. 5.

THESE ARE FACTS

4320 threaded parts a day for over three months! That's the record of a single "Acorn" Die cutting .098—100" brass screws with ¼-inch of thread. Moreover, the threads are gage-checked for size and optically inspected for appearance and finish. "Acorn" Dies are accurate, tough, long-lived.

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Such records are possible because every "Acorn" Die is checked and tested. Whether you require a standard die or a special die makes no difference.

Every "Acorn" Die is "special" in that it has been individually tested.

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Greenfield, Mass.

Detroit Plant: 2102 West Fort St.

Warehouses in New York, Chicago, Los Angeles and San Francisco

In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.

GREENFIELD

Shapes

Structural Shape Prices, Page 74

Pittsburgh—Awards are heavy, and inquiries continue fair. Private work predominates. New projects include a large number of highway bridges.

Chicago—Producers have booked a large tonnage of structural shapes, but fabricators note delays in deliveries as a result of congestion at mills. Inquiries are steady, although small miscellaneous work is more active.

Boston—Except for placing of 1850 tons for a Pratt & Whitney building, Hartford, Conn., structural steel activity is featureless. Few large tonnages are pending, but private construction is becoming relatively more active than public work.

New York — Award of 1550 tons for another apartment building brings the total of such contracts to six the past ten days, involving close to 7500 tons of steel. Several more are pending. Awards also include 1600 tons for a New York school.

Philadelphia — Volume of new work has tapered following the rush to cover the past week or two. Several round tonnages remain pending, however. While no price announcement has been made for

Shape Awards Compared

	Tons
Week ended Oct. 7	25,063
Week ended Sept. 30	24,224
Week ended Sept. 23	24,408
This week, 1938	13,202
Weekly average, year, 1938	21,568
Weekly average, 1939	22,765
Weekly average, September	27,395
Total to date, 1938	802,438
Total to date, 1939	910,586

Includes awards of 100 tons or more.

first quarter, a $3 advance is indicated.

Seattle—Fabricators report a noticeable increase in business, with jobs of less than 100 tons taking a substantial aggregate tonnage. Largest project pending involves 1455 tons for the Lewis river state bridge, Washington.

San Francisco — Several fairly large structural lettings have been placed. Aggregate for the week amounted to 3185 tons, bringing the total for the year to 116,731 tons, against 123,083 tons a year ago. Awards including 906 tons for the Metropolitan office building, Sacramento, Calif., and 837 tons of piling for the United States engineer office, Los Angeles.

Shape Contracts Placed

1850 tons, factory building, Pratt & Whitney division, United Aircraft Corp., Hartford, Conn., to R. C. Mahon Co., Detroit.

1800 tons, Santee-Cooper dam, Charleston, S. C., to Virginia Bridge Co., Roanoke, Va.

1600 tons, public school 118, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa., through Depot Construction Co., New York, contractor.

1550 tons, apartment building, 877 Fifth avenue, New York, to Harris Structural Steel Co., Inc., New York.

1400 tons, bridge, contract MS-39-14, circumferential highway, Queens, N. Y., to American Bridge Co., Pittsburgh, through Johnson, Drake & Piper Co., New York.

1100 tons, addition Philadelphia Electric Co., Chester, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

1050 tons, apartment, Fifth avenue and Ninth street, New York, to Harris Structural Steel Co., New York; Simons Bros., New York, builders.

1000 tons, state bridges 601 and 602, Eau Claire, Wis., to Duffin Iron Co., Chicago.

906 tons, Metropolitan office building, Sacramento, Calif., to Bethlehem Steel Co., San Francisco.

837 tons, piling, United States engineer, invitation 509-40-25, Los Angeles, to Bethlehem Steel Co., Los Angeles.

700 tons, hospital addition, University of Pennsylvania, to Ingalls Iron Works, Co., Birmingham, Ala., through United Engineers, Philadelphia.

700 tons, open-hearth crane runway, Republic Steel Corp., Warren, O., to American Bridge Co., Pittsburgh.

700 tons, plant addition, Hammermill Paper Co., Erie, Pa., to Erie Steel Construction Co., Erie, Pa.

660 tons, stockhouse, Liebmann Brewery, Brooklyn, N. Y., to American Bridge Co., Pittsburgh, through Industrial Engineering Co., New York.

650 tons, office and warehouse, Potter-McCune Co., McKeesport, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

530 tons, 14-story apartment, Lexington avenue and Thirty-seventh street, New York, to Dreier Structural Steel Co., New York.

500 tons, building, Proctor & Gamble Co., Quincy, Mass., to New England Structural Co., Everett, Mass.

480 tons, turbine foundations, Consolidated Edison Co., East Fortieth street, New York, to American Bridge Co., Pittsburgh.

450 tons, state bridge over Arikaree river, Wray, Colo., to Bethlehem Steel Co., Bethlehem, Pa.

400 tons, building, Alton Box Board Co., Alton, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

400 tons, fourth quarter requirements, Atchison, Topeka & Santa Fe railroad; 250 tons to Bethlehem Steel Co., Bethlehem, Pa., and 150 tons to Joseph T. Ryerson & Son Inc., Chicago.

310 tons, sea-going barge and lighter for Yuba Mfg. Co., San Francisco, to unnamed interest.

305 tons, five-story mercantile building, Little Rock, Ark., to Arkansas Foundry Co., Little Rock.

300 tons, alterations, Plaza hotel, Newbury, N. Y., to Belmont Iron Works, Philadelphia.

285 tons, factory buildings, Cleveland Pneumatic Tool Co., Cleveland, to Republic Structural Steel Co., Cleveland.

275 tons, state bridge over Little Snake river, Wamsutter, Wyo., to Des Moines Steel Co., Des Moines, Iowa.

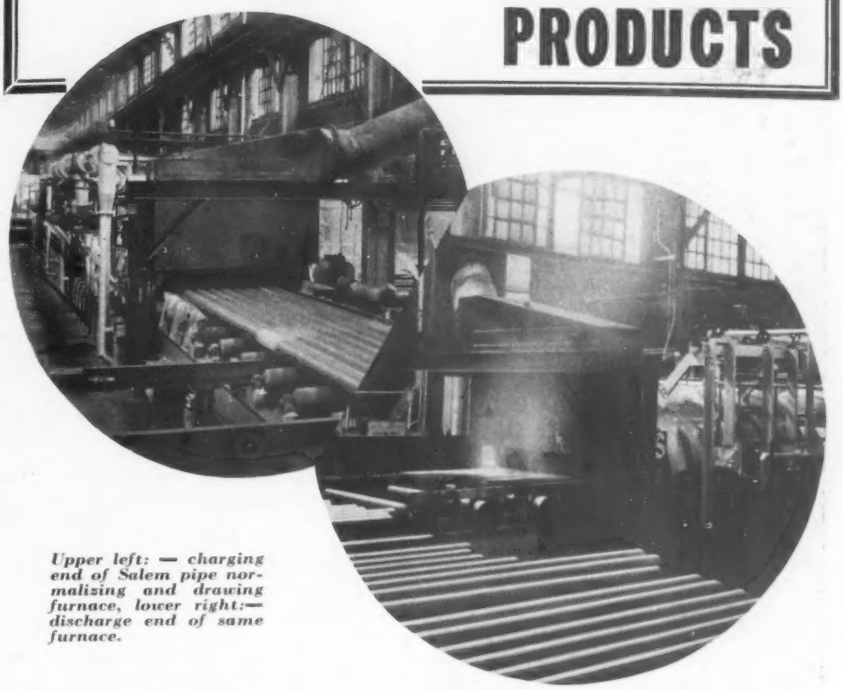
260 tons, plant building, Cleveland Graphite Bronze Co., Cleveland, to Mooney Iron Works Co., Cleveland.

250 tons, state bridge FAS-8534, Apex, N. Y., to Harris Structural Steel Co., New York.

240 tons, factory addition, Heald Machine Co., Worcester, Mass., to R. C. Mahon Co., Detroit.

210 tons, Montgomery Ward & Co. store, West Palm Beach, Fla., to Virginia

A TUBULAR FURNACE for TUBULAR PRODUCTS



Upper left: — charging end of Salem pipe normalizing and drawing furnace, lower right:— discharge end of same furnace.

The solution to another difficult problem—to normalize and draw pipe in the same furnace—has been achieved by "Salem" engineering.

The furnace shown treats 18 tons of pipe, either normalizing at 1650 deg., Fahr. or drawing at 900 deg., Fahr. with normalizing gas consumption as low as 750,000 B. t. u. per ton and as low as 600,000 B. t. u. for drawing. One hour is required to raise furnace from draw temperature to normalizing temperature; two hours to lower from normalizing to draw. The cooling process does not require the wasteful use of pipe to cool furnace down to draw temperature.

Information on this or other "Salem" achievements in industrial heating problems gladly furnished on inquiry.

SALEM ENGINEERING COMPANY

SALEM, OHIO, U. S. A.

New York Chicago Detroit Pittsburgh
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SALEM ENGINEERING COMPANY

Bridge Co., Roanoke, Va.

200 tons, steel shells for bridge, Atchison, Topeka & Santa Fe railroad, over Arroyo Seco, Los Angeles, to unnamed interest.

195 tons, buildings, Union Oil Co., Oleum, Calif., to Herrick Iron Works, Oakland, Calif.

180 tons, wheel and foundry shops, Chicago, Milwaukee, St. Paul & Pacific railroad, Milwaukee, to Milwaukee Bridge Co., Milwaukee.

175 tons, mill building, Flexible Co., Loudonville, O., to Berger Iron Works, Canton, O.

175 tons, addition to warehouse, Paterson-Leitch Co., Cleveland, to Bethlehem Steel Co., Bethlehem, Pa.

165 tons, addition to shipping room, Revere Copper & Brass Co., Rome, N. Y., to American Bridge Co., Pittsburgh.

150 tons, housing project, Charleston, W. Va., to Fireproof Products Co., Charleston, W. Va.; Skilken Bros., Columbus, O., contractor; bars not yet awarded.

150 tons, Ridge Road housing project, Washington, to Rosslyn Steel Co., Rosslyn, Va.; John McShain Co., Baltimore, general contractor. Bethlehem Steel Co. awarded 50 tons, reinforcing bars.

145 tons, dam, Knightsville, Mass., to American Bridge Co., Pittsburgh.

135 tons, five-story building, Bond Mfg. Co., Wilmington, Del., to Belmont Iron Works, Eddystone, Pa.

130 tons, bridge FAP-592-A, Dallas county, Texas, to The Beaird Corp., Shreveport, La.

130 tons, repairs to drawbridge Z6A, Chicago, Milwaukee, St. Paul & Pacific railroad, Chicago, to Duffin Iron Co., Chicago.

125 tons, traveling crane, gates, etc., specification 12-B, imperial irrigation district, El Centro, Calif., to unnamed interests.

125 tons, power plant, Parker dam, Parker, Ariz., to unnamed interest.

120 tons, senior high school, Keene, N. H., to Lyons Iron Works, Manchester, N. H.

120 tons, building, Borden Co., Troy, N. Y., to Lehigh Structural Steel Co., Allentown, Pa., Equity Construction Co., New York, contractor.

120 tons, garage and service building, Union Electric Co., St. Lous, to Mississippi Valley Structural Steel Co., Decatur, Ill.

115 tons, bridge FAP-179-D(2), Yazoo county, Mississippi, to Jones & Laughlin Steel Co., Pittsburgh.

110 tons, housing project, Jamaica, N. Y., to Empire City Iron Works, New York; through H R H Construction Co., New York.

100 tons, state highway project SS.39-18, Johnson road, Albany county, New York, to Lackawanna Steel Construction Co., Buffalo; Sheehan Construction Co., Albany, contractor, $33,649, bids Sept. 20. Mesh, 16 tons, to American Steel & Wire Co.

100 tons, three small bridges, Newfane, Vt., to American Bridge Co., Pittsburgh; R. J. Pierce, Brattleboro, Vt., general contractor, $17,182.50.

100 tons, Mud Mountain dam project, Washington state to Isaacson Iron Works, Seattle.

100 tons or more, factory building, Thomas A. Edison, Inc., Bellville, N. J., shapes to Keystone Structural Steel Co., Trenton, N. J.; Fatzler Company, Newark, contractor.

100 tons, state bridge, Dunbury, N. H., to Lackawanna Steel Construction Co., Buffalo.

100 tons, shapes and bars, Machias river bridge, Whitneyville, Me., to American Bridge Co., Pittsburgh, and Bancroft & Martin Rolling Mills, Inc., Portland, Me.; Ralph Cianchette, Pittsfield, Me., contractor.

Shape Contracts Pending

5520 tons, three C-3 type cargo vessels, United States maritime commission; Moore Drydock Co. Oakland, Calif., low.

3056 tons, two seaplane hangars, naval air base, Alameda, Calif.; H. Mayson, Los Angeles, low on general contract at $874,000.

2850 tons, building for Consolidated Aircraft Co., San Diego.

1455 tons, Lewis river state bridge, Washington; MacRae Bros., Seattle, general contractor.

1400 tons, sub-assembly shop, Portsmouth, Va., United States bureau of yards and docks; Ralph S. Herzog, Philadelphia, low.

1350 tons, public school 118, New York.

1000 tons, apartment building, Fifth avenue and Seventy-fourth street, New York.

900 tons, three Illinois state highway bridges; bids in.

750 tons, shapes and plates, filtration plant, Los Angeles; bids Oct. 27.

700 tons, building, National Gypsum Co., New York.

700 tons, four state highway bridges, Kansas.

650 tons, addition to Vultee Aircraft Co., Downey, Calif.; Consolidated Steel Corp., Los Angeles, low.

600 tons, addition to North American Aviation Inc., Los Angeles; Bethlehem Steel Co., Los Angeles, low.

545 tons, state highway project RC-2576, Erie county, New York; bids Oct. 25, Albany.

450 tons, beam spans, various locations, Missouri Pacific railroad.

400 tons, post office and federal building, addition, Lincoln, Nebr.

300 tons, three continuous plate girder spans, Alsea river, Linn county, Oregon, for bureau of roads; Sig Ash, Portland, low at $87,678.

300 tons, shop building, torpedo station, Newport, R. I.

300 tons, library, Yale university, New Haven, Conn.; Dwight Building Co., contractor.

300 tons, addition, Frankford arsenal, Philadelphia; bids Oct. 15.

250 tons, grade separation, Detroit, for state.

250 tons, marine barracks, Quantico, Va.; bids Oct. 11.

250 tons, state bridge, Beaverton, Mich.

245 tons, five-span continuous overpass, 435.16 feet overall, U. S. route 5, Barton, Vt.; bids Oct. 13 to H. E. Sargent, commissioner of highways, Montpelier. Also takes 80 tons, reinforcing steel.

230 tons, power house, Central Light & Power Co., Corpus Christi, Tex.; bids in.

225 tons, addition to boiler house, Procter & Gamble Co., Cincinnati.

220 tons, structural steel work for Kentucky dam, Tennessee Valley Authority, Knoxville, Tenn.; bids Oct. 9. Bids Oct. 10 on 95 tons, steel castings, and Oct. 11 on 190 tons, rolled steel armor, for same project.

200 tons, grade separation, Watersmeet, Mich., for state.

200 tons, theater building, for Bridge & Second Street Realty Corp., Oswego, N. Y.

200 tons, state bridge 1862, Decatur, Ind.

200 tons, state bridges 433 and 434, Waupaca, Wis.

200 tons, state bridge PSC-6566, Andover, N. Y.

200 tons, theater, Oswego, N. Y.

160 tons, cell blocks 9 and 10, Greenhaven, N. Y., for state.

160 tons, state highway bridge, Luzerne county, Pennsylvania.

150 tons, state bridge, Rippey, Iowa.

150 tons, grade separation, Baltimore & Ohio railroad, Wood county, Ohio, for state.

150 tons, extension to factory, Sprague Meter Co., Bridgeport, Conn.

150 tons, factory addition, Sprague Meter Co., Bridgeport, Conn.

140 tons, state hospital buildings, Central Islip, N. Y.

140 tons, state bridge, Wadhams, Mich.

130 tons, Crestwood subway, Milwaukee, for state.

125 tons, state bridge 259, Racine, Wis.

120 tons, girder spans, Southern railway, Washington.

100 tons, state highway bridge, Essex county, New York; bids Oct. 25, Albany.

100 tons, industrial building, Philadelphia; John M. Gill Co., Philadelphia, contractor.

Unstated tonnage, double leaf bascule bridge, Coos county, Oregon; Tom Lillibo, Reedsport, Oreg., low.

Reinforcing

Reinforcing Bar Prices, Page 75

Pittsburgh—Minor changes have been made in extras and deductions on concrete bars, effective Oct. 1. These affect trucking, bending, designing, detailing and listing extras. The market continues fairly active, with prices firm. In some cases prices are above the going market, although sales at these figures are not verified.

Chicago — Business continues brisk, following one of the busiest months in history during September. Mills are nearly if not completely sold out for the quarter, particularly in billet bars. New projects include two housing developments, Peoria, Ill., and a General Electric Co. warehouse here.

Boston—Following the purchase of close to 6000 tons for housing and dam projects, active tonnage in New England has dropped to a low level, scattered small-lot requirements being estimated at 500 tons. Building and highway mesh has been advanced $3 a ton.

Philadelphia—Jobs requiring several hundred tons invidually are fairly numerous, but large tonnages are absent. Entire market is firmer as a result of stiffening in rerolled material.

Concrete Bars Compared

	Tons
Week ended Oct. 7	**12,054**
Week ended Sept. 30	**12,133**
Week ended Sept. 23	**7,676**
This week, 1938	**4,814**
Weekly average, year, 1938	**6,959**
Weekly average, 1939	**9,761**
Weekly average, September	**9,002**
Total to date, 1938	**264,096**
Total to date, 1939	**390,458**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

2500 tons, housing project, Dorchester district, Boston, to Concrete Steel Co., Boston; Rugo Construction Co., Boston, contractor.

2000 tons, 102-inch reinforced concrete pipe line, water and power department, Los Angeles, to unnamed interest.

1063 tons, sewage treatment plant, Hammond, Ind., to Republic Steel Corp., Cleveland.

915 tons, two lots, Fort Peck dam, Ariz., to Sheffield Steel Corp., Kansas City, Mo.

700 tons, Thomas Jefferson Memorial school and library, Washington, to Hudson Supply Co., Washington; Jeffress-Dyer, Washington, contractors.

700 tons, South End housing project, Boston, to Joseph T. Ryerson & Son Inc., Chicago, through C. J. Maney Co. Inc.

650 tons, administration group, municipal center buildings, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; D. M. W. Contracting Co., contractor.

550 tons, Rock creek diversion sewer, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; Stiers Bros., St. Louis, contractor.

500 tons, bridge, Greenpoint avenue and Forty-third street, Queens, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh; Tully & DiNapoli, New York, contractors.

500 tons, Abbott hall, Northwestern university, Evanston, Ill., to Calumet Steel Co., Chicago.

400 tons, Cincinnati warehouse of Kroger Grocery & Baking Co., to Pollak Steel Co., Cincinnati.

300 tons, store, S. S. Kresge Co., Buffalo, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Crooker, Carp & Skaer, contractors.

300 tons, pumping station, Grand Rapids, Mich., to Inland Steel Co., Chicago, through Grand Rapids Steel Supply Co.

200 tons, navy yard, Washington, Req. 450, to Joseph T. Ryerson & Son Inc., Chicago.

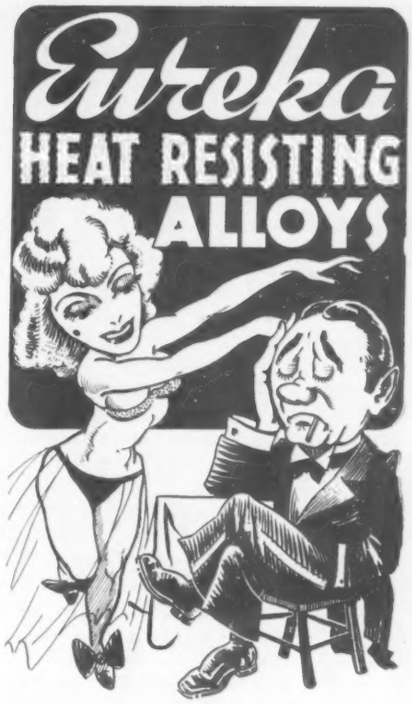
198 tons, bridge, Dittmars avenue and Grand Central parkway, contract 1, Queens, N. Y., to Fireproof Products Co., New York; Corbetta Contracting Co., New York, contractor.

168 tons, stockhouse, Leibmann Brewery, Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., Philadelphia, through Industrial Engineering Co., N. Y.

110 tons, route 6, section 12, Passaic river bridge, Montville, N. J., to Joseph T. Ryerson & Son Inc., Philadelphia, through Gray Construction Co., Morristown, N. J.

100 tons, state highway project, Cattaraugus county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; The Admiral Construction Co., Buffalo, contractor.

100 tons, mesh, highway project RC-4077,



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Ardsley-Elmsford, Westchester county, New York, to Wickwire Spencer Steel Co., New York; Ottaviano & MacDonald, Inc., Croton-on-Hudson, N. Y., contractor, $142,744.10, bids Sept. 20.

100 tons, grade elimination, Baltimore & Ohio railroad, Buffalo, N. Y., to Truscon Steel Co., Youngstown, O., through Metzger Construction Corp.

Reinforcing Steel Pending

4350 tons, bureau of reclamation, invitation 33,333-A, Redding, Calif.; Columbia Steel Co., San Francisco, low.

3000 tons, additional housing projects, Boston.

3000 tons or more, second graving dock, Puget Sound navy yard; bids at Washington, Oct. 18.

1138 tons, treasury department, invitation 9564, list 717, Los Angeles; bids opened.

1130 tons, bureau of reclamation, invitation 33,341-A, Redding, Calif., Bethlehem Steel Co., San Francisco, low.

900 tons, Glenside housing project, Reading, Pa.

450 tons, Lewis River bridge, Clark and Cowlitz county, Wash.; general contract to MacRae Bros., 614 Fifth avenue, Seattle, at $486,361.

450 tons, Missouri state highway bridges. Caruthers & Couch, Kansas City, low on 300 tons in Howard county; C. H. Atkinson Paving Co., Chillicothe, Mo., low on 150 tons in Dunklin county.

445 tons, state bridge, Lewis river, Washington; MacRae Bros., Seattle, general contractor.

350 tons, housing project, Lowell, Mass.

300 tons, building at Plymouth, N. C., Kleckhefer Container Co., Delair, N. J.

250 tons, mesh, highway project RC-4079, Hamilton county, New York; bids Oct. 25, Albany.

288 tons, housing group, Alcatraz Island, Calif.; Louis C. Dunn, Monadnok building, San Francisco, low on general contract at $266,500.

214 tons, bridge over Arroyo Seco, Los Angeles; bids opened.

200 tons, mesh and bars, bridge, New London, Conn.; A. I. Savin Construction Co., Hartford, Conn., low.

175 tons, dock, Alcatraz Island, Calif.; bids opened.

155 tons, marine barracks, Quantico, Va.; bids Oct. 11.

150 tons, William Howard Day homes, Harrisburg, Pa.

130 tons, box sewer, Milwaukee.

130 tons, highway project, Waterford, Conn.; Arute Bros., New Britain, Conn., low.

120 tons, relief sewer, Piney branch, Washington.

116 tons, and foundations, navy yard, Brooklyn, N. Y.; I. B. Miller Co., New York, low.

101 tons, engine test building, naval air base, Alameda, Calif.; Johnson, Drake & Piper, Los Angeles, low on general contract at $143,700.

100 tons, Shapiro Packing plant, Detroit.

100 tons or more, two state ward buildings, Buckley, Wash.; bids at Olympia, Oct. 16.

Unstated, 372-foot state viaduct, Oregon City, Oreg.; McNutt Bros., Eugene, Oreg., general contractor.

Unstated tonnage, two housing projects, Peoria, Ill.

Unstated tonnage, estimated 700 tons, General Electric Co., warehouse Chicago.

Pig Iron

Pig Iron Prices, Page 76

Pittsburgh — Pig iron production continues to gain, with 38 of the district's 50 blast furnaces active and at least two more stacks scheduled to go in shortly. Coke supply has retarded lighting of some units, although output of beehive ovens is growing.

Chicago — Some orders still are being taken for $23 iron, but lots usually are small and of a fill-in nature. All low-priced iron has been shipped. Shipments in September were 150 per cent ahead of August. So far in October shipments are 40 per cent larger than a month ago.

New York — Shipments are well sustained, with some sellers predicting a heavier movement than last month, when tonnage was augmented by releases against low priced contracts which expired Sept. 30.

Philadelphia—Sellers are experiencing some increase in business as a result of sharp increase in scrap prices. Principal activity, however, involves shipments against orders booked prior to the price advance.

Buffalo — With fourth quarter bookings the heaviest in at least two years, some of the pressure from consumers for immediate shipment has subsided. Foundry operations are expanding along with iron shipments, but inventories still are light.

Cincinnati — Shipments reflect steady expansion in the melt to above 70 per cent. Higher scrap prices also are stimulating pig iron consumption, improvement in which is well diversified. Foundry coke prices are being continued unchanged into October at $9.75, delivered.

St. Louis—October shipments are expected to exceed those of September, best since 1937. Consumption also is expanding, as reflected in a 35 per cent gain in coke movement last month. Jobbing foundries report a large amount of new business.

Toronto, Ont.—Higher prices have had little effect on sales since most large melters previously covered for the quarter. Spot buying is slightly heavier, however. Pig iron production is gaining, seven of Canada's ten blast furnaces being active.

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Steel in Europe

Foreign Steel Prices, Page 77

London—(*By Cable*)—Reasonable price increases on iron and steel products are expected after Nov. 1. Ordinary steel consumers are obtaining some deliveries, and limited exports are being done. Semi-finished supplies are improved. Demand for light iron castings is reviving. Scrap now is being controlled, with buying and selling licenses to be required and prices fixed.

Belgium and Luxemburg report export trade continues difficult. The coke and ore situation is slightly easier.

Tin Plate

Tin Plate Prices, Page 74

Tin plate production jumped 7 points last week to 90 per cent, as mills recently idle resumed operations. Domestic demand is heavy, with consumers building up stocks that had been subnormal. Canadian demand also has increased with the shutting off of the source of Welsh plate, and business from South America is increasing. Export prices are higher than the domestic market in most cases.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 75

Bolt and nut prices are unchanged, but revisions in discounts on stove bolts, cap screws and set screws now are effective. Stove bolts in packages now take 72.5 off with nuts separate. An extra of 15 per cent is charged when nuts are attached. Discount on stove bolts in bulk has been reduced from 84 to 83.5. Cap screw discount has been changed from 67.5 to 70, with the set screw discount reduced from 70 to 64. Business in all types of products continues active and widely scattered.

Scrap

Scrap Prices, Page 78

Pittsburgh — Prices still are headed upward, heavy melting steel moving up an additional $1.50 last week. No. 1 steel reached $24 to $24.50. High prices reflect strength following sale of the Baltimore & Ohio railroad list on which $26 was reported paid for No. 1 railroad steel.

Cleveland — Shipments continue to go forward on old orders taken at prices several dollars below present levels. New buying is almost nil, confined to a car or two. Quotations have not changed in the week.

Chicago—Most grades are up 50 cents, following large tonnage sales to a local mill at prices involving $20 for No. 1 steel. Market still is strong, although some interests feel it is leveling off.

Boston—Domestic demand for the first time in several years is instrumental in advancing scrap prices. Latest upturns are based on buying for eastern Pennsylvania shipment rather than dock delivery.

New York — Shipments to eastern Pennsylvania are heavy, with prices still advancing. Cast grades are up $2, and domestic prices are instrumental in pushing quotations on all grades for barge delivery up 50 cents to $1. Export business is hampered by lack of ships.

Philadelphia—Practically the entire scrap list is quoted higher, but consumers are taking a firmer stand on prices and all factors are watching market for evidence the peak has been reached. Four thousand tons of new compressed automobile sheet scrap brought $22.50.

Buffalo — Prices continued to soar last week. Heavy melting steel rose a total of $2, with a sale of about 6000 tons of No. 2 material made at $20 to $20.50. Dealers are reluctant to do business at new levels, feeling the advance has not yet reached its peak.

Detroit—Following another sharp upturn last week, the market appears to be leveling off at the new levels. Advances of $1 to $2 a ton were general throughout the list, except for machine turnings which were up only 50 cents.

Cincinnati—Prices are up $1 a ton on the heavier grades. Dealers continue bullish. Shipments to consumers are steady, but mill buying has not been particularly active.

Toronto, Ont. — Recent price advances are stimulating offerings, but supplies still are below normal. Consumers are taking delivery for spot needs, with new buying relatively light.

Seattle—Prices have advanced materially. Reports indicate little export business but increased domestic turnover. Trans-Pacific freights on scrap have doubled in the last month, berth lines asking $10 and $11.25 against $5.50 and $6.25 for rails and melting steel, respectively.

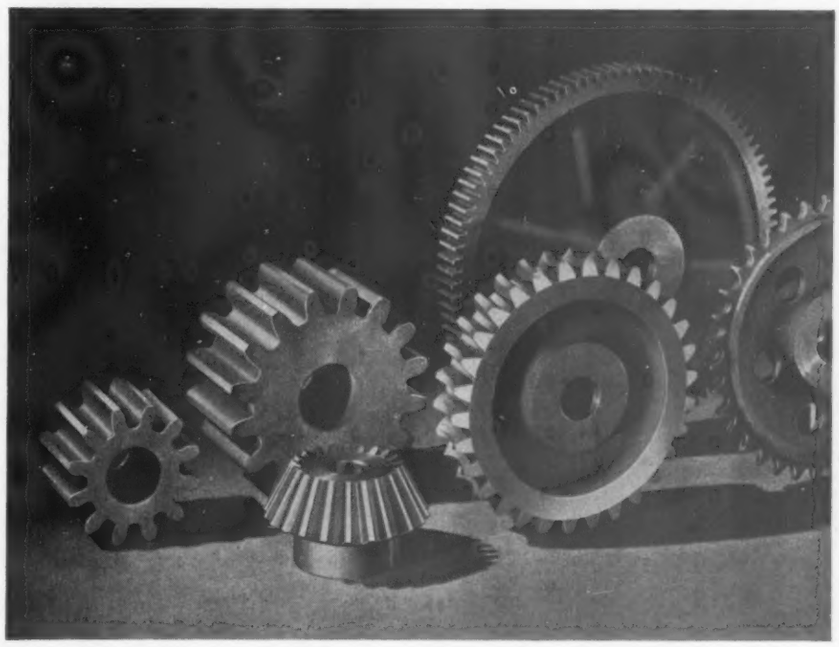
San Francisco—Scrap prices have soared recently, f.a.s. quotations on No. 1 heavy melting steel advancing $5. Japanese interests have been buying in large quantities at around $21 f.a.s. New bottoms have advanced $5 a ton to $9.50, and Japanese interests still have a number of bottoms that can still be filled under old quotations.

St. Louis—Stimulated partly by two mill purchases and a large inquiry for another tonnage, scrap prices continue to advance. Increases for the week in most cases were more than $1 a ton.

Warehouse

Warehouse Prices, Page 77

Seattle—Hot-rolled carbon bars have been increased 35 cents per



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100 pounds. Demand for this product in particular, as well as for other items has been heavy lately and stocks in some cases are running low.

Cleveland—Base prices on products included in the hot-rolled group are being continued, but quotations on quantities above 1999 pounds have been increased.

Pittsburgh — Hot-rolled products have been increased 10 cents in two quantity brackets, with base prices on lots of 400-1999 pounds unchanged. Cold-finished bar prices have been revised to conform with recent mill changes, the base price now applying on 1500 pounds and over, instead of 1000 pounds.

Chicago—Galvanized sheets have been advanced 25 cents, the third increase in several weeks, with the base quantity restored to 500-1499 pounds. Sales continue to gain, while inquiries are still heavier.

Boston—Galvanized sheet prices have been advanced, No. 24 gage now being quoted 4.86c. Round edge tire steel, bars and small shapes are also higher. Volume is well maintained, notably specialties and some alloys.

Baltimore — Effective Oct. 9, warehouse prices are being advanced here $5 a ton on plain carbon bars, bands, strip, floor plates and hoops, No. 14 and heavier, and $3 on tank plates and shapes.

Nonferrous Metal Prices

Sept.	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
30	12.00	12.12½	12.25	60.00	47.00	5.50	5.35	6.50	20.00	14.00	35.00
Oct.											
2	12.00	12.12½	12.25	58.00	46.00	5.50	5.35	6.50	20.00	14.00	35.00
3	12.00	12.00	12.25	57.00	46.00	5.50	5.35	6.50	20.00	14.00	35.00
4	12.00	12.00	12.25	55.00	45.75	5.50	5.35	6.50	20.00	14.00	35.00
5	12.50	12.50	12.25	56.00	46.50	5.50	5.35	6.50	20.00	14.00	35.00
6	12.50	12.50	12.25	56.00	47.00	5.50	5.35	6.50	20.00	14.00	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb., except as specified. Copper brass products based on 12.50c Conn. copper

Sheets

Yellow brass (high) 19.06
Copper, hot rolled 20.87
Lead, cut to jobbers 8.30
Zinc, 100 lb. base 11.25

Tubes

High yellow brass 21.81
Seamless copper 21.37

Rods

High yellow brass 14.96
Copper, hot rolled 17.37

Anodes

Copper, untrimmed 18.12

Wire

Yellow brass (high) 19.31

OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York 8.37½-8.50
Cleveland 9.37½-9.62½
Chicago 8.62½-8.87½
St. Louis 8.50-8.75

Heavy Copper and Wire

New York, No. 1 ..... 10.00-10.25
Cleveland, No. 1 .....9.87½-10.12½
Chicago, No. 1 .....9.87½-10.12½
St. Louis 9.75-10.00

Composition Brass Turnings

New York 8.00-8.25

Light Copper

New York 8.00-8.25
Cleveland 8.12½-8.37½
Chicago 7.87½-8.00
St. Louis 7.75-8.00

Light Brass

Cleveland 4.62½-5.12½
Chicago 5.62½-5.87½
St. Louis 5.00-5.50

Lead

New York 4.85
Cleveland 4.62½-4.75
Chicago 4.25-4.50
St. Louis 4.00-4.25

Zinc

New York 3.50-3.75
Cleveland 3.50-3.75
St. Louis 3.50-3.75

Aluminum

Mixed, cast, Cleveland 10.25-10.50
Borings, Cleveland 7.75-8.00
Clips, soft, Cleveland 15.75-16.00
Misc. cast, St. Louis 8.00-8.25

SECONDARY METALS

Brass ingot, 85-5-5-5, less carloads ..13.75
Standard No. 12 aluminum...14.00-15.00

Nonferrous Metals

New York — Activity in nonferrous metals last week was characterized by continued heavy demand which generally exceeded offerings. After the advance of ½-cent in electrolytic copper, however, inquiry was fully satisfied at the new level Consumption remained heavy with copper and brass mills at 100 per cent of capacity, tin plate mills at 90 per cent and galvanized sheet output at 76 per cent.

Copper — All leading producers advanced electrolytic prices to the basis of 12.50c, Connecticut, but held casting copper unchanged at 12.25c, f.o.b. refinery. Sales were estimated at about 40,000 tons. Copper and brass mill rolled and drawn product prices advanced generally ¼-cent while brass ingots held unchanged.

Lead — Despite assurances from producers that no shortage in supplies is likely and that no further upward price revision is being considered at present, sales again exceeded daily intakes and some producers were forced to draw on reserve supplies. Prices held at 5.35c, East St. Louis.

Zinc — Undertone of the market remained firm at 6.50c, East St. Louis, and some buyers had difficulty in obtaining desired tonnages. Shipments during September soared to an all-time high, resulting in the sharpest drop in stocks on record.

Tin — Prices remained entirely nominal with Straits spot estimated at around 56.00c at the close. The tight situation is being relieved

Antimony—Only routine business was reported with prices steady at 14.00c, New York, for American spot in cases and nominally 14.00c, duty paid New York, for Chinese spot.

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Construction and Enterprise

Pennsylvania

MEADVILLE, PA.—City, R. L. Phillips, engineer, plans construction of municipal incinerator, to cost $50,000.

SOMERSET, PA. — Somerset Rural Electric Co-operative Inc., Harvey S. Jennings, superintendent, has been allotted $200,000 REA fund for construction of 164 miles rural transmission line in Somerset, Fayette counties, Pennsylvania, and Garrett county, Maryland.

WARREN, PA.—Warren electric co-operative, W. L. Armitage, president, has $187,000 REA allotment to finance construction of 172 miles rural transmission line in Warren and Erie counties.

Connecticut

NEW LONDON, CONN.—Public works officer, submarine base, plans purchase and installation of two 600 kilowatt motor generator sets with control panels. (Noted Aug. 7.)

NEW LONDON, CONN.—City, T. Fitch, purchasing agent, is taking bids to Oct. 23 on construction of sewage treatment and garbage incineration plants. Solomon & Keis, 257 Broadway, Troy, N. Y., consulting engineers.

New York

BINGHAMTON, N. Y. — City, J. A. Giles, engineer, plans construction of sewage disposal plant; to cost $1,000,000.

NEW YORK—Commonwealth & Southern Corp., Wendell L. Wilkie, 20 Pine street, New York, president, plans approximately $1,000,000 expenditure on improvements of public utilities in South Carolina; work to be part of proposed $50,000,000 plant facility improvement program throughout the nation.

WELLSVILLE, N. Y.—Moore Steam Turbine Co., subsidiary of Worthington Pump & Machinery Co., Harrison, N. J., will take bids soon on installation of electric crane and auxiliary equipment.

Ohio

CINCINNATI—E. Kahn Sons Co., 3241 Spring Grove avenue, plans installation of new turbine and boiler, structural changes. Carl J. Kiefer & Associates Inc., Schmidt building, engineers.

SHEFFIELD LAKE, O.—Village, C. W. King, mayor, will vote on $62,000 bond issue Nov. 7 as village's share of cost for construction of sewage system and disposal plant by WPA. R. F. MacDowell, Chester-Twelfth building, Cleveland, consulting engineer.

Illinois

CHICAGO—Butler Street Foundry & Iron Co., F. M. Hinkens, 6836 Calumet avenue, president, plans to rebuild a 2-story and basement foundry; to cost $40,000 or more.

WAUKEGAN, ILL.—Midland Mfg. Co. plans construction of 2-story factory. Jerome M. Malter, 2515 Winnemac avenue, Chicago, architect.

Indiana

BREMEN, IND.—Mutti Foundry Inc. has filed incorporation papers; 90 shares no par value capital stock; Oscar E. Mutti, Herman R. Larson, Richard L. Pell, others are incorporators.

DECATUR, IND.—Board of public works plans extensions and improvements in municipal electric power plant, including installation of new 5000 kilowatt turbine generator unit and accessories; boiler and auxiliary steam station equipment; switchboard, transformers and accessory equipment. Cost estimate being drawn up. Froehlich & Emery Engineering Co., Second National Bank building, Toledo, O., consulting engineers. (Noted Sept. 25.)

Wisconsin

EAU CLAIRE, WIS.—Eau Claire electric co-operative, F. R. McFarland, superintendent, has been granted $100,000 REA allotment for construction of 96 miles rural transmission line in four counties.

FRIENDSHIP, WIS.—Adams-Marquette electric co-operative, J. C. Joyce, superintendent, plans construction of 143 miles rural transmission line with $146,000 REA allotment.

GREENWOOD, WIS.—Clark electric co-operative, W. A. Dallman, superintendent, has $99,000 REA fund for construction of 102 miles rural transmission line in three counties.

Minnesota

LAKEFIELD, MINN.—Village, E. P. Whitney, clerk, has completed sketches for construction of complete sewage treatment plant. Toltz, King & Day Inc., 1509 Pioneer building, St. Paul, consulting engineers.

WALDORF, MINN.—Village, George A. Pream, clerk, will vote Oct. 17 on $10,000 bond issue to aid financing waterworks construction with WPA aid. Total cost to be $28,000. Ealy G. Briggs, 1957 University avenue, St. Paul, consulting engineer.

Texas

AUSTIN, TEX.—Lower Colorado river authority, Fritz Englehard, Room 806, Littlefield building, chairman, will open bids about Oct. 25 for construction of power house at Marshall Ford dam.

DENISON, TEX.—City, A. M. Brenneke, city engineer, has plans in progress for water works and sewer improvements, enlargement of filtering plant, new sewage treatment plant, other apparatus, to cost about $370,000.

Kansas

BURLINGTON, KANS.—Coffey county rural electric co-operative has been granted $102,000 REA fund for construction of rural transmission line.

STERLING, KANS.—$198,000 bond issue carried at recent election to finance construction of new power plant building, diesel generating sets, switchboard and new feeder lines. Robert F. Peart, city manager. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineers. (Noted Sept. 11.)

South Dakota

FLANDREAU, S. DAK.—East Central South Dakota electric association has $132,000 REA grant for construction of rural transmission line.

WALL, S. DAK.—West river electric association, R. F. Lewis, secretary, will advertise for bids soon on construction of rural transmission line to cost about $143,000.

WEBSTER CITY, S. DAK.—City, Frank Gruby, auditor, will start work on sewage disposal plant construction immediately; to cost $33,000, WPA project. E. S. Mannes, city engineer.

Nebraska

COLUMBUS, NEBR.—Loup river public power district, Harold Kramer, secretary, has approved plans and will take bids to Oct. 17 on construction of two 34,500 volt power lines from its power plant to the city of Columbus.

OMAHA, NEBR.—Chicago, Burlington & Quincy Railroad Co., F. T. Darrow, chief engineer, plans to install escalator in Burlington passenger station. To cost about $40,000.

STANTON, NEBR. — Stanton county rural public power district, Clark Colborn, superintendent, has awarded contract to Summit Construction Co., Rapid City, S. Dak., for construction of 165 miles rural transmission line to serve 350 customers in three counties. Putnam & Woolpert, Emerson, Nebr., consulting engineers.

Iowa

ESTHERVILLE, IOWA—City, F. J. Ehlers, mayor, is taking bids to 7:30 p.m., Oct. 30 on construction of extensions to municipal power plant consisting of one diesel engine, not less than 1500 nor more than 2000 horsepower, complete with generator, exciter, exhaust and intake silencers, air filter, day tank, starting air tank; and compressor, pyrometer, alarms, exhaust silencer for present 500 horsepower engine. Specifications on file with clerk. Certified check 5 per cent to accompany bid.

HARLAN, IOWA—Nishnabotna valley rural electric co-operative, George H. Hess, superintendent, will take bids soon for construction of 146 miles rural transmission line in four counties. H. H. Henningson, 1904 Farnam street, Omaha, Nebr., is consulting engineer. (Noted Sept. 25.)

MARSHALLTOWN, IOWA—Marshall county rural electric co-operative has secured $198,000 REA grant to finance construction of rural transmission line.

MUSCATINE, IOWA—Board of water and light trustees, Herman Zeug, secretary, is taking bids to Oct. 21, 7:30 p.m., on transformers for municipal light plant improvement as per specifications filed with secretary. Stanley Engineering Co., Muscatine, consulting engineer. Certified check 5 per cent to accompany bid.

Pacific Coast

PORTLAND, OREG.—General contract for construction of warehouse for J. I. Case Co. branch, Southeast Third and Market streets, has been placed with Drake, Wyman & Voss, Portland. Estimated cost, $65,000.

SEATTLE—Bureau of Fisheries, 2725 Montlake boulevard, has called bids Oct. 20 for furnishing eight screen drums, 10 x 12 feet, for the Prosser, Wash., project; also five screen drums, revolving type, 12 x 14 feet, for the Black Canyon project, near Emmet, Idaho. Bids to include metal work and accessories.

SPOKANE—Washington Water Power Co. plans construction of transmission and distributing power line at Conconully, Wash.

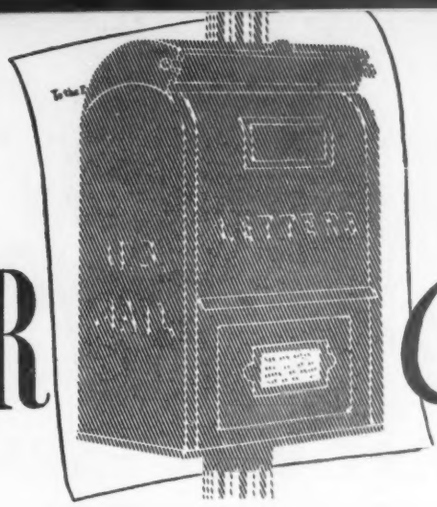
SUNNYSIDE, WASH.—Voters have approved $100,000 bond issue for proposed water system improvements.

VANCOUVER, WASH. — Vancouver Iron & Steel Foundry is clearing site at 1202 West Thirteenth street for construction of $30,000 plant, 80 x 105 feet, to replace structure recently destroyed by fire. D. W. Hilborn, Vancouver, architect.

Alaska

NOME, ALASKA—U. S. Smelting, Mining & Refining Co. plans additional power plant to augment present 5000 horsepower generating unit. Fireproof building designed to house two diesel-powered generators of 1400 horsepower each will be erected.

READER Comments



Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

American Industries First

To the Editor:

Close study of Walter S. Tower's recommendations regarding the state department's declared intentions of negotiating a new trade pact with Belgium, reported in STEEL, Oct. 2, merits, in my opinion, the hearty endorsement of every steel products manufacturer in the United States. High protective tariffs for many years were the keynote of American policy. Through their beneficent influence United States has become the leading manufacturing nation of the world.

Although the original necessity for stimulating industry in this nation is a thing of the past, nevertheless there are still many factors to be considered before we grant such important concessions to foreign manufacturers. As Mr. Tower has said, any tariff concessions will accrue to the advantage of foreign producers, primarily because of much lower production costs.

Foreign trade is essential to the prosperity of any nation, especially so in the case of a capitalistic democracy such as ours. However, in order to derive the maximum benefit from such a policy, it must be formulated and administered with caution. Emphasis should be placed, regarding imports, that articles and materials already produced in sufficiency by our own industries be kept at a minimum.

It has been pointed out by proponents of the pact that the amount of steel products imported is infinitesimal compared to the total production in the United States. True enough, but nevertheless it provides an opening wedge which might some day be driven deeply enough to disrupt our economy severely. Europe continually embroiled in internal strife as it has been the past few years is not greatly to be feared, from an economic viewpoint. However, Europe at peace, with government subsidized industries, low living standards and consequent low production costs is a factor that must be reckoned with in the future.

Certainly our steel industries, with a continually higher operating cost and dwindling margin of profit will be unable to meet the competition of foreign producers on an even footing. In self-protection, then, it is imperative that we do not make any most-favored-nation trade pacts dealing with those commodities we are well equipped to produce.

SALES MANAGER

New York

We Can Stay Out of War

To the Editor:

One job America's press should undertake is that of exploding the dangerous and false notion that this nation must sooner or later be dragged into Europe's war.

As pointed out recently by W. T. Holliday, president, Standard Oil Co. of Ohio (STEEL, Oct. 9, p. 21), "Recent polls of public opinion seem to indicate a distressingly large percentage of the people in the United States has gained the idea that inevitably we will be drawn into the conflict. That is a philosophy of despair, a defeatism which if not dispelled may become an affirmative force toward putting us into this war."

No one can deny that eventually we have nothing to gain and everything to lose in becoming involved. Vehement expressions from business, labor, and national groups of all types leave no doubt this country wants no war. A complete and stringent embargo on commerce of every sort with belligerents would not keep us out so long as the public has this preconceived idea that all efforts to remain neutral will not avail. This fallacy must be destroyed.

The United States will not become involved if we have the will and intelligence to remain levelheaded, refusing to permit propaganda to sway our reason. If we are willing to fight for peace we will not go to war.

MANUFACTURER

Baltimore

"Depreciation, Dividends"

To the Editor:

The letter headed "Depreciation and Dividends" which appeared in STEEL, Oct. 2, p. 9, signed "Accountant," certainly shows little accounting knowledge of business.

It appears the gentleman was ashamed to sign his name after trying to set up an idea that the "reserve account" is kept in a long green thing in the safe to be paid out at any time. (Editor's note: The gentleman referred to, a recognized steelworks accountant, signed his name to his letter but for obvious reasons requested it not be used.)

If a business could achieve what the accountant has tried to tell us should be done, industry would not given a damn if all Europe wanted to fight at the same time.

GEORGE A. MAURATH

President,
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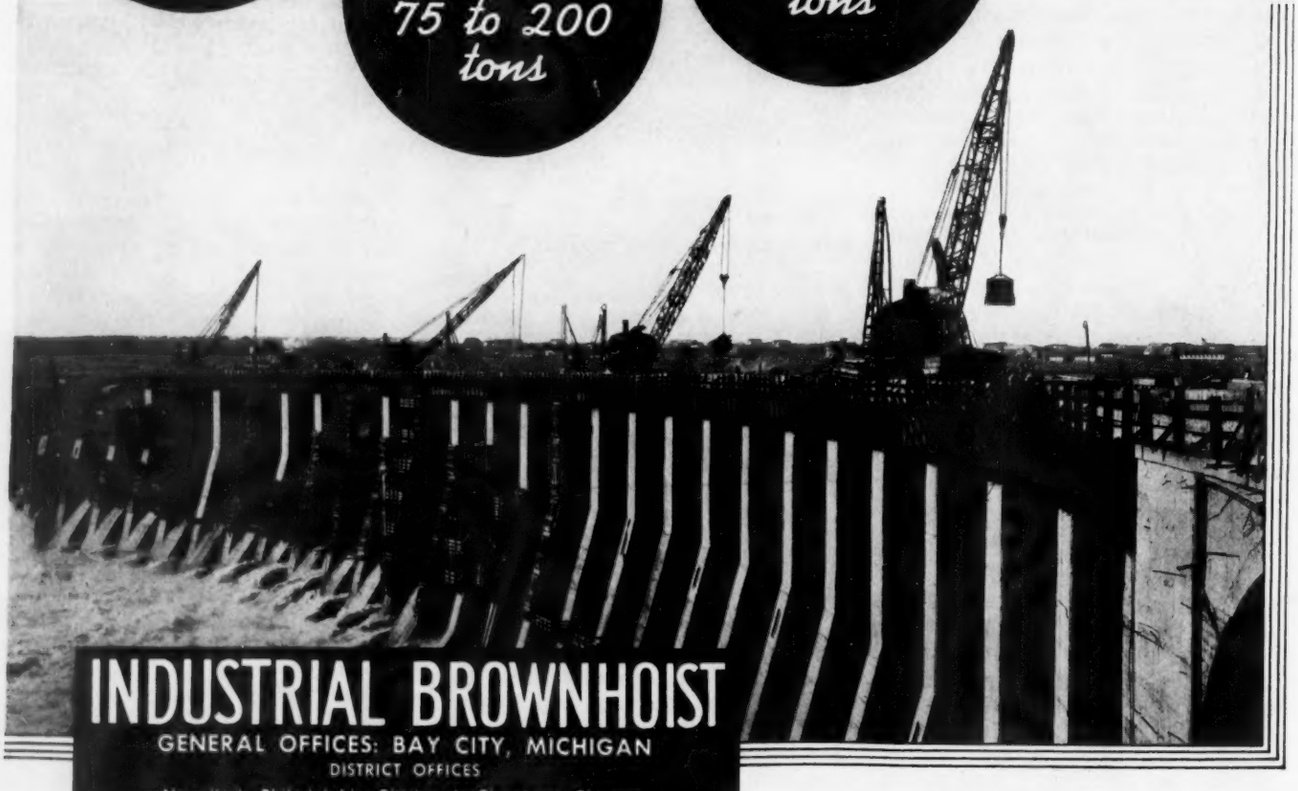

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